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George Long, Society for the Diffusion of Useful Knowledge (Great Britain)

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SCANDEROON, or ISKENDEROON, or ALEXANDRETTA, formerly called Alexandria, a seaport town in the north of Syria, at the head of the Gulf of Scanderoon, which was founded by Alexander the Great. It is a very unhealthy place, whence it is called in one of the antient Itineraries *Alexandria scabiosa*, and only owes its importance to its being the seaport to Haleb or Aleppo. Its unhealthiness is in a great measure owing to the waters which flow down from the mountains, and collect in great marshes around the town. Moryson, who visited it in 1596, represents it as 'a poor village, built all of straw and dirt, excepting some houses built of timber and clay in some convenient sort, and it lies all along the sea-shore. For the famous city of Aleppo having no other haven, the merchants do here unload their goods, but themselves make haste to Aleppo, staying as little here as possibly they can, and committing the care of carrying their goods upon camels to the factors of their nations continually abiding there. The pestilent air is the cause that they dare not make any stay there, for this village is compassed on three sides with a fenny plain, and the fourth side lies open upon the sea' (quoted by Russell, *Natural History of Aleppo*, vol. i., p. 358, Lond., 1794). Niebuhr (*Beschreibung*, &c., vol. iii., pp. 18, 19, Hamburg, 1837), who visited Scanderoon in 1766, describes its situation and state in much the same terms, and says, that with the exception of the houses of the vice-consuls and merchants, it contains only sixty or seventy poor dwellings, inhabited for the most part by Greeks. He adds, that there are the remains of some building in the morass surrounding the town, which proves that the place was formerly much larger than it is at present. A similar account of the state of Scanderoon is also given by a still more recent traveller (Damoiseau, *Voyage en Syrie et dans le Désert*, p. 4, Paris, 1833).

SCANDINAVIA is a term adopted in geography and history, and is of great antiquity. The name Scandinavia occurs in Pliny (*Hist. Nat.* iv. 13), who states that Scandinavia is the best known island in the Sinus Codanus (the Baltic), and is of unascertained dimensions. The part which was known was inhabited by the Hilleviones, who had five hundred pagi or districts. This description seems to refer to the large peninsula which forms the north-western portion of the continent of Europe, and comprehends the countries which at present are known under the names of Norway and Sweden. The area of this peninsula is somewhat more than 300,000 square miles, and it is consequently one-third greater than France, but as the largest portion of it is covered with sterile mountains, it is in general thinly inhabited, and the whole population does not much exceed four millions.

The small sovereignties which existed in this peninsula when it first began to be noticed in history, became united into the two great monarchies of Sweden and Norway in the twelfth and thirteenth centuries. But the internal governments of these states were so ill arranged, that the countries were continually a prey to internal wars, and they were the scenes of never-ceasing bloodshed. In the mean time Denmark had acquired a more regular government, and the famous Margaret, queen of Denmark, succeeded in uniting the crowns of Denmark, Sweden, and Norway in her own person. Norway was acquired by inheritance, and Sweden by conquest.

By the union of Calmar (1397) these countries were never to be disjoined. Norway indeed remained united with Denmark up to 1814, but Sweden was separated from it in the middle of the fifteenth century. From that time the two countries of Scandinavia constituted separate states, until the year 1814, when Denmark was obliged to cede Norway to Sweden, and Norway submitted to the new order of things. Since that time the whole peninsula has been under the same king, but the two countries of Norway and Sweden have preserved their constitutions, which differ in every respect. [NORWAY; SWEDEN.]

SCANDINAVIAN LITERATURE. The antient Scandinavian language, once common to the whole north-western portion of Europe beyond the Baltic, is now confined to Iceland, where it has undergone little change since the ninth century. [ICELAND.] This dialect of the Gothic is the parent stock of both Swedish and Danish, the former of which tongues has retained more of the original character than the other, which is also the language of Norway; and if not for the literature they contain, in a philological point of view they deserve far more attention than they have hitherto obtained from Englishmen, since they throw considerable light on the history of our own language. There is also a striking similarity of construction between them and English, which renders them of comparatively easy acquisition to ourselves. Nearly the same grammatical simplicity prevails, nor are their verbs and nouns subject to those numerous changes of terminations which render such languages as the German and the Russian so perplexing to a foreigner. Into the subject of Scandinavian literature, properly so called, we do not propose to enter, it being one of such magnitude that of itself alone it would require as much space as can be afforded for a literary-historical sketch of the two nations whom we here place together under the same common title.

Literature, in the usual meaning of the term, was of exceedingly tardy development in both Denmark and Sweden; for what learning there was, continued for a long time to be confined to the Latin of the schools. The people however possessed an abundant stock of those traditional poetical records which scarcely lay any claim to individual authorship, being rather the embodying of the sentiments and feelings of an entire race than those of individuals. Of these national songs there are many distinguished by the title of Kiæmpe Viser, or Heroic Ballads, which strains of romantic minstrelsy serve to give an idea of the compositions of the antient bards or skalds. Deeds of arms and bravery constitute their main subjects; for in the infancy of states personal courage and physical strength are regarded as the chief titles to pre-eminence, more especially in such a region as Scandinavia, where the sword was the only patrimony of the younger branches of a family, and was a possession quite as honourable and frequently more lucrative than that of the soil. Possessing a very great extent of sea-coast, the inhabitants regarded that element also as their natural territory. Their piratical expeditions, undertaken partly through necessity and partly from the love of adventure, obtained for them a fearful fame; and the leaders of these hardy pirates assumed the imposing title of Sea-kings. These 'Viser' contain moreover no small quantity of legendary fable and supernatural lore, derived from the antient Sagas and the mythology of the Edda [EDDA], whose wild traditions, half oriental and half northern, were so congenial to the spirit of the people that they continued to cherish the remembrance of them long after the establishment of Christianity (which was not earlier than the commencement of the eleventh century); and in modern times they have been largely made use of by Oehlenschläger and other living or recent poets, who have found in them a source of powerful interest for their countrymen. For a while indeed it was very doubtful whether the Gospel would prevail against the popular belief in the Valhalla. The labours of the early missionaries in the ninth and tenth centuries produced very little effect; the people continued to be almost entirely pagan, and Svend Tvæskiæg, the successor of Harald, renounced Christianity, and did all he could to re-establish the worship of the antient idols; nor was it until after the accession of Canute the Great (1014) that Christianity became the national religion, and churches and convents began to be built. For several years afterwards however little improvement took place in the intellectual condition of the people. Literature can hardly be said to have been cultivated at all. Its sole monument is the history (written in Latin) by Saxo Grammaticus, who died in 1208. In the same century, the first public library was formed at Lund, in Sweden, which was then under the dominion of Denmark; but during the following century literary studies rather declined, being superseded on the one hand by the system of dialectic then in vogue; and on the other, by extravagant monkish legends. In the fifteenth century the university of Copenhagen was established by Christian I., and opened in 1479; yet it was long before either that event or the adoption of the principles of the Reformation effected any improvement in education or in the intellectual condition of the people.

In the mean time the language itself, now one of the softest in sound and most simple in construction of all the Gothic dialects, which had begun to change from that of Iceland in the eleventh and twelve centuries, gradually borrowed more and more from the Low-German, but did not acquire any fixity until the fifteenth. Its progress was greatly retarded by Latin being employed as the language of the clergy and students, and German as that of the court and the higher classes. Although it possesses scarcely any literary value in itself, otherwise than as a specimen of the language at that period, the most remarkable production of the fifteenth century is 'Den Danske Riimkronike' (or chronicle in rhyme) of Niel, a monk of Soröe, who being desirous of giving his countrymen their annals in a more popular form, made use of the work of Saxo Grammaticus, continuing it from the substance of other Latin records, but moulding the whole differently, and making each monarch relate his own exploits and the events of his reign. The first edition of this work is that of 1495, and one was published by Molbech in 1825, illustrated by an introduction and a glossary. Not long after Niel, a priest at Odensee, named Mikkel, obtained some celebrity by his religious poems, the longest of which is in honour of the rosary, and breathes the spirit of Roman Catholic devotion. As a model of style, of language, and versification, this production places its author at the head of the Danish poets of the fifteenth century. About twenty years later, the same place (Odensee) gave Denmark another writer of some note in its literary annals, namely, Christian Hansen, a schoolmaster, who first attempted dramatic poetry, and whose compositions, though barbarous in taste, and both grotesque and coarse in their dialogue, are not wholly destitute of merit as regards style, nor of interest as throwing some light on the manners and opinions of the age. The real poetry however of the whole of this period is to be sought for in the national ballads and other compositions of popular minstrelsy, which, though despised by those who affected any sort of learning, were ardently cherished by the rest of the people. The first printed collection of such pieces was that published by Sorenson Wedel, the translator of Saxo Grammaticus, in 1591, at the instance of the queen Sophia. Its success was so great that it quickly passed through several editions, and in 1695 Peter Syv added a second hundred pieces to the first, which it originally contained. Since that time similar collections have been published at various times; and one of the best and most complete is that by Abrahamson, Nyerup, and Rahbek, in 5 vols. 8vo., Copenhagen, 1812-14.

Together with the Reformation came a change in literary taste—an impulse towards literature, from Germany. Romances of chivalry, legends, tales of magic, moralities, and similar works, were translated from that language, as were also some pieces of Hans Sachs, of the Dutch poet Cats, and even of the Scots Lindsay. Still notwithstanding that the classics, both Greek and Latin, were now generally studied, no one thought of taking them as models of composition, instead of servilely copying contemporaries who were themselves little advanced before them. Consequently, scarcely a name of the slightest importance has been preserved, until we arrive at that of Anders Arrebo, in the seventeenth century, whose fame is now limited to his being considered the morning star, or rather the harbinger of the modern literature of Denmark. This writer, who was born in the island of Aeröe, in 1587, studied at the university of Copenhagen, and became bishop of Drontheim at the age of thirty, but was afterwards deprived of his dignity, and retired to Malmöe in Sweden, where he died in 1637. His chief production is his 'Hexaemeron,' a poem in heroic rhyme, on the creation, in imitation of that by Du Bartas, and it displays considerable refinement of language and versification. To him succeeded Anders Bording and Thomas Kingo, the first of whom was a more industrious than gifted writer. He published a great number of poetical pieces in a work edited by himself, under the title of 'The Danish Mercury,' which were little more than a rhyming chronicle of the events of the day. Kingo, who has been termed the Dr. Watts of Denmark, on account of the religious cast of his poetry, and who was the son of a weaver, entered the church, and became bishop of Fynen. His celebrity among his contemporaries was very great, and he certainly possessed much genuine talent; but his private character was by no means the most amiable. He was even sordidly avaricious, and the man who expressed so many noble and generous sentiments displayed in his own conduct much that was despicable and mean. Still he is exempt from the reproach of countenancing vice in others by the laxity and immoral tendency of his own productions. His writings still continue to be read, nor is it many years since his 'Psalms' were reprinted with a very numerous list of subscribers. Jörgen Jörgenson Sorterup is almost the only other name of any importance belonging to this period. Inferior to Kingo in poetical feeling, he had the merit of breaking through the literary mannerism of the time, and striking into a different route. His 'Heltesange,' or heroic songs, wherein he celebrates the naval achievements of his countrymen and the victories of Frederic IV., revive, though in an inferior degree, the animated strains of the older Kæmpe Viser. After all, Sorterup and his immediate predecessors constitute only the first faint dawnings of Danish literature, which in Holberg suddenly attained to a noon-day brightness. [HOLBERG.]

In a sketch like the present we cannot recapitulate Holberg's chief productions, while to examine them as they deserve, and so as to give a satisfactory idea of them and of their author's varied talents, would be matter for a volume of some bulk. In speaking of such a man, it is difficult to award him his just praise without seeming to fall into exaggeration; for what he is fairly entitled to is known only to those who are actually acquainted with his writings. As the author of 'Peder Paars,' he has been compared not only to Butler, but to Hogarth, and although no imitator of either, he rivals both the poet and the painter in satiric humour. That production alone would have immortalised him among his countrymen. The same may be said of his comedies: with defects and sins against good taste which no one would now fall into, they are marked by great dramatic power and genuine humour.* There is scarcely any branch of literature which he left unattempted, but he was not equally successful in all. In some of them he has since been greatly surpassed by other Danish writers, but there is no one who has yet equalled him in his own peculiar line. He was to Danish literature what Peter the Great was to Russia. He gave it a sudden and powerful impulse, and produced a no less beneficial than extraordinary change in the intellectual tastes of his countrymen, whom he taught to read and to think. In short, if 'Don Quixote' alone will repay a student for the task of acquiring the Spanish language, so will the works of Holberg indemnify an Englishman for the labour, or rather the recreation, of making himself acquainted with a language so nearly allied to his native tongue.

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* The English reader will find a well executed specimen of Holberg as a dramatist in an entire scene from his comedy of 'Don Ranudo Collibrados,' in the Appendix to Feldborg's 'Denmark Delineated,' which work also contains much interesting information relative both to the artists and the literary men of that country.

Contemporary with Holberg were Gram, Falster, Sneedorff, and Tullin. The first of these, who was Archivarius of Denmark, was an acute and industrious antiquary and historian. His inquiries threw much light upon the more obscure portions of Northern annals; and some of their results were given to the world in the notes to the Florentine edition of Meursius's 'History of Denmark.' Though his productions were inconsiderable in number, Christian Falster acquired no small repute as a satirist, in which character he wrote in a still bolder and bitterer tone than Holberg himself, while as a poet he was certainly superior to him. His satires went through several editions between 1730 and 1750.

Sneedorff is not a name of great eminence, yet he was a most serviceable labourer in the field of literature—one to whom the language itself is greatly indebted for the example which he set of a pure, elegant, and graceful style, such as no previous writer had attained to. These qualities rendered his periodical, entitled 'The Patriotic Spectator,' exceedingly popular, and contributed to improve the taste both of readers and of writers. As a poet he has far less merit, though his poems were much admired in their day. We may in this place mention Tyge Rothe, professor of philosophy at the university of Copenhagen, for, like Sneedorff, he greatly contributed to refine the language, and his work on the 'Love of One's Country' is a finished model of style. When he attempted verse however his eloquence forsook him; his philosophical poem on the 'Destiny of Man' shows him to have been more favoured by the goddess of wisdom than by the muses.

What Sneedorff and Rothe did for prose, Tullin performed for poetry; he gave it the charm of melody, ease, and richness; on which account, although not a poet of the first order, he may fairly be considered a master in the mechanical part of the art. In that respect he may be classed with Pope, and he also occasionally resembles the English poet in his moral strains. He was acquainted with the English poets, and seems to have imbibed no small portion of the spirit of Young, whom he closely approaches in his 'Skabningens Ypperlighed,' or poem on the creation, which displays a similar loftiness in the conceptions and deep religious sentiment. This production had many admirers in Germany, and Jenisch pronounces it to be a work displaying a fiery imagination, unrivalled by anything of the kind in his own language. Tullin was certainly not devoid of poetical power: indeed his thoughts are often sublime and most happily expressed. His lyrical pieces possess much elegance and tenderness, and they encouraged a number of imitators, some of them mere versifiers, while none of them produced more than agreeable trifles.

We now arrive at a period of the literature—of its poetry especially, which may be designated as that of Ewald [Ewald], for he impressed upon it a character till then unknown, vivifying it by his own fervid genius. If Holberg was the founder of Danish comedy, Ewald was the creator of the national tragedy. His 'Rolf Krage' (1770) forms an epoch in the drama, being the first model of that species of it which has since been so successfully cultivated by Oehlenschläger and others. As a lyric poet he stands still higher, and some writers have pronounced him the most perfect and powerful master in that branch of the art that the world has ever yet seen. Distinguished by genius, he was scarcely less so by misfortune, which may in some degree be attributed to his imprudence, as well as to disappointment, and to the cold indifference of those who should have patronised him as an ornament to their country. A tithe of the posthumous honour and applause bestowed upon him would have cheered, perhaps prolonged his bitter and brief existence. Contemporary with Ewald, his coheritor in indigence, his counterpart in many respects, his opposite in others, was Johan Herman Wessel, who, like Holberg, was a native of Norway, and like him possessed much comic talent and turn for humorous satire. Of these qualities he gave proof in his dramatic epigram or parody entitled 'Kierlighed uden Strömper' (Love without stockings) (1772), which experienced a very different reception from Ewald's 'Rolf Krage,' for its success on the stage was almost unprecedented, and it became such a favourite, that it was not uncommon for persons to know the whole of it by heart. Nevertheless he is said not to have intended it for representation, and to have been so doubtful of its success on the stage, that it was with the greatest difficulty his friends could prevail upon him to offer it. After this production, his tales in verse are those which exhibit him to most advantage, since they earned for him the title of the Danish Lafontaine. They partake however more of the manner of Prior.

For convenience sake we may here put together the names of the brothers Trojel, Bull, Weyer, Fasting, Samsöe, Storm, and Suhm, as those of the principal writers of the time who closed their career before the end of the century. Peter Magnus and Peter Cofod Trojel claim notice chiefly for their songs and bacchanalian lyrics, a species of poetry in which the Danes have greatly distinguished themselves. Magnus is also known by his satires and poetical epistles, some of which possess considerable merit. Bull was the author of some ethic and didactic poems, but as a writer he has no great merit. Niels Weyer was a poet of more than ordinary promise, but as he died at the age of twenty-one, his works do not show the refined fruits of talent. Claus Fasting obtained more celebrity by his epigrams, some of the best in the language, than by his tragedy of 'Hermione.' The other three are far more important names in our catalogue; yet that of Samsöe we may dismiss at once, referring to what has already been said of him [Samsöe], and pass on to Edward Storm. If Storm were known only by his comic epic 'Bragur,' in hexameter verse, his reputation would not be high, since, if not absolutely a failure, it is a very moderate performance, and by no means to be compared with his tales and fables, which display much genuine comic humour, and some of which are particularly felicitous, exhibiting that keen relish for the ludicrous which appears to be a trait in the national character. Nor are his ballads less admirable: they breathe the genuine spirit of the antient minstrelsy, and, but for their modern diction, might be taken for compositions of the antient Skalds. Suhm's claims to celebrity are of a different kind, for though not without pretensions as a poet, it is by his historical works that he adorned the literature of his country. His 'History of Denmark' (in 11 vols.) displays extraordinary diligence and research, and is a work of no ordinary merit, though its value is now in some degree lessened by recent productions of the kind, such as G. L. Baden's (in 5 vols., 1829-32) and L. C. Müller's (2 vols., 1835-6). He also wrote many historical tales and narratives (occupying three volumes in the collection of his works), founded upon antient traditions, and giving lively pictures of the manners and habits of the former population of Scandinavia, and of the national character.

Before the close of the century a new school, at least a new generation, had begun to spring up. Both Rahbek and Baggesen had already made themselves favourably known to the public, and the first had already done much towards popularising a taste for literature by his two periodical publications, the 'Minerva' (commenced in 1785) and the 'Danish Spectator,' both of which obtained merited success. About the same time Baggesen had made himself a favourite with the public by his 'Comic Tales,' decidedly the best of their kind in the language; while, in his 'Labyrinthen,' or Tour through Germany, Switzerland, &c., he had produced the most admirable specimen of a prose style that the literature possesses. Yet considering how much more both of them afterwards performed, these writers can be said to have been at this period only in the early part of their career. That of Oehlenschläger, a name now of European celebrity, may be dated from the first years of the nineteenth century, the poetical pieces by him, which appeared in 1803, being almost the first of his published productions; and in the following year the first book of his rifacciamento, or modernised version of the Edda, printed in Rahbek's 'Charis.' With the 'Edda' he proceeded no further than that specimen, but in his dramas and some other works he has re-opened the stores of antient Scandinavian fable and mythology, and revived the olden spirit of his fatherland.

As a better opportunity does not offer itself, we will here make mention of two writers, who ought not to be passed over, although we do not know whether they may not be still living. At the end of the eighteenth century the Danish drama was signalised by one of the best productions of its kind which had then appeared, 'Niels Ebbesen,' a tragedy, by Christian Levin Sander. The celebrity which it obtained was such that it was translated into several languages. Nor is it the less remarkable as being the only successful effort of the author, whose other dramatic attempts, especially in comedy, hardly attain mediocrity. Shortly afterwards (1804) appeared 'Det Befriede Israel' ('Israel Delivered'), an epic poem in hexameters, by Jens Michael Hertz, which was certainly a failure upon the whole, notwithstanding it contains detached parts of considerable merit. In fact Danish literature cannot yet boast of a single epic; yet if it has nothing which strictly answers to that title, it possesses some narrative poems of the kind, such as Ingemann's 'Valdemar' (not his romance of that name), and his 'Black Knights,' which are meritorious performances.

Other names which may here be introduced as those of writers belonging to the last decennium of the century, but whose biographical dates we are unable to specify more clearly, are Otto Horrebow, Edward Colbiornsen (who died about 1791), and W. H. F. Abrahamson, all of whom possessed considerable poetical talent in compositions of a descriptive or didactic class. To these may be added Magd. Sophia Buchholm, who in 1793 published some poems which were highly creditable both to her talent and her feeling. About the same time appeared three volumes of comedies and other dramatic pieces by the elder Heiberg, some of the best original productions that had then been given to the stage since the days of Holberg. Olufsen too distinguished himself (1793) by a solitary masterpiece, his 'Gulddaasen,' which as a specimen of comedy made no less sensation than Samsöe's 'Dyvecke' did in tragedy.

Jacob Baden, the earliest on our list of those who, although they belong as writers to the eighteenth, lived also in the nineteenth century, did very much for the language by his 'Grammar Raisonné,' by his 'Critical Journal,' and by various philological treatises which have become established authorities for idiom and style. He is also known by his able translation of Tacitus. His wife, who was born in 1740, and who survived him, also possessed literary talent, and published 'Den Fortsatte Grandison,' a continuation of Richardson's romance.

J. C. Tode, though a German by birth and a physician by profession, nevertheless distinguished himself in literature as a humorous writer, as which his 'Moralske og Satiriske Afhandlinger' (1793) exhibit him to great advantage, and show him to have possessed a fund of pleasantry. His Fables are also among the best in the language. He was chiefly ambitious of shining in comedy, but though he produced several very clever pieces, which were at the time an acquisition to the stage, they are not marked by any superior merits. From those who have spoken of the writers of Denmark, Foersom has been so far from obtaining the notice he deserves, that his name has scarcely been mentioned by any of them; all the more valuable therefore is the biographical account given of him by Feldborg. It is true he was not an original writer, but he performed for his countrymen the essential service of enabling them to enjoy Shakspere in a worthy form. 'His translation of Shakspere,' says Feldborg, 'is as much a work of genius as a statue of Thorvaldsen's or a tragedy of Oehlenschläger's.' This is a high encomium, and, we are willing to believe, well merited also, though we cannot positively vouch for its being quite free from exaggeration. However, it is certain that as far as he proceeded in it (for he translated only some of the plays) he executed his arduous task with true devotion.

The year 1821 deprived Denmark of four of its poets—Rein, Thaarup, Zetlitz, and Pram. Rein holds a subordinate rank, although his narrative pieces possess much merit. Thaarup, on the contrary, was a literary veteran, who, besides having produced two of the best and most popular operas in the language, had distinguished himself in the higher species of lyric poetry, especially in his Hymns and Cantatas. Zetlitz occupies a respectable station, by his satires and poetical epistles, and also by his heroic odes. Relative to Pram we need add nothing here to the account already given of him. [PRAM.] Baggesen's is a name which stands out prominently from those of almost all the rest of his countrymen, he being in that respect nearly upon a level with Oehlenschläger; and the extended celebrity which they both enjoy is due to another cause besides the intrinsic merit of their works, namely, to their having written many of them in German, or afterwards reproduced them in that language. That Baggesen should ever have employed a foreign tongue is greatly to be regretted, because he was capable of using his own in the most attractive manner. His translation of Holberg's 'Niels Klimm,' for instance (which was originally written in Latin), is a happy specimen of style. He seems to have aimed at temporary celebrity rather than permanent fame, when he joined the thronged ranks of German literature, in which he could hope to attain only a second-rate or third-rate reputation, whereas in his own he might have occupied a foremost place. He was a writer of varied talents, and in his lyric pieces he touched every mood, from the sublime to the burlesque, from the gay to the pensive. In his other writings he frequently showed much of Voltaire, of Wieland, and of Sterne. Unfortunately he did not direct his powers either so advantageously to himself or so usefully to others as he might have done. His life was an unsettled one, during the greater part of which he lived self-banished from his country; and he also suffered himself to be too much engaged by literary party quarrels, repeatedly attacking Oehlenschläger, Rahbek, and others with violent bitterness.

Less gifted than Baggesen, with more of industry and of tact than of superior talent, Rahbek raised himself to an honourable place in Danish literature. It was as a journalist, critic, and literary historian, rather than as an original writer, that he commanded attention, for in the last character he was merely pleasing and agreeable, without displaying much peculiar power of any kind. His 'Erindringer mit Liv,' or Reminiscences, is however an interesting autobiography, far more detailed than Oehlenschläger's.

After Rahbek, we come to Oehlenschläger himself, Ingemann, and other writers who are yet living, and at whom we can take no more than a hasty glance. The writings of the first-mentioned alone would form the subject of a long analysis, and have in fact been frequently so examined both in German and in English periodicals. That he looked for subjects, if not exactly for models, in the legends of the older Scandinavian history and mythology, has already been mentioned; but he has also occasionally gone to the east and to the south for them. His 'Fiskeren' and 'Aladdin' are two charming dramatised poems in Oriental costume, while his 'Correggio,' a piece more adapted in its form to the stage, presents us with the idea of a true artist. Yet although the dramatic is his favourite form of composition, he has attempted many others; among these is his 'Nordens Guder,' styled by himself an epic, but rather a cyclus of ballads or narrative poems in different metres, recording the fabled adventures of the Scandinavian deities. He has also written a romance in 4 volumes, entitled 'Oen i Sydhavet,' or 'The Island in the South Sea,' which is a sort of 'Robinson Crusoe,' prolix, it is true, but not more so than Defoe's. Ingemann has obtained celebrity not only as a poet, but also in the field of historical romance, and is generally complimented with the title of the Walter Scott of Denmark. His chief production of that kind, 'Valdemar Seir,' has recently been translated into English. Several other writers have since cultivated the same species of composition; and foremost among them stand Carsten Hauch (who has displayed great dramatic power in tragedy) and Petersen. Thus it is not improbable that Danish literature will soon be able to show some original productions of that kind, whereas it has hitherto possessed scarcely any but translations, those by its own writers being rarely more than mere tales, and Kruse being almost the only one who can be regarded as a novelist; yet as far as his own country is concerned, many of his later productions cannot be taken into account, since they are written in German. He has however written several dramatic pieces in Danish, a collection of which was published in four volumes, 1818-20. Stein Blicher's novels are not only more recent but more truly Danish than Kruse's, inasmuch as they depict the national character with graphic fidelity. Another writer, who conceals himself under the assumed name of Karl Bernard, has also produced some spirited manners-painting novels.

If no second Holberg has arisen, Denmark now possesses among its living writers several able dramatists; one of the most recent of whom, Hertz, has revived the true tone and spirit of comedy; while the younger Heiberg has cultivated the romantic and poetical drama with great success, and likewise rendered himself a favourite with the public by his vaudevilles. Chr. Bredahl's 'Dramatiske Scener,' 5 vols., 1819-32, display marks of real genius. Of C. J. Boye we know little; nevertheless his 'William Shakspere' (1826) entitles him to mention from us, not only on account of the interest which the subject itself possesses for our countrymen, but also for the ability with which it is treated. Tieck, König, and others have taken Shakspere as the hero of their fictions, but scarcely one has exhibited him so naturally.

In other branches of literature Denmark possesses several eminent scholars and men of science. Rask's name is known as one of the most eminent philologists of the present century; and to his may be added those of Grundtvig, Petersen, and Rafn, all of whom have laboured diligently and successfully in northern archæology and history. The study of northern antiquities has been greatly promoted by the establishment of the Royal Society of Northern Antiquaries at Copenhagen. Besides his other historical works, the 'Bibliotheca Anglo-Saxonica' of Grundtvig recommends him to literary antiquaries in this country; which remark applies also to L. C. Müller's 'Collectanea Anglo-Saxonica,' 1834. In classical archæology the Chevalier Bröndsted has acquired European celebrity by his 'Travels and Researches in Greece,' and other works. The name of Professor Oerstedt is generally known by his labours in electricity and magnetism. His younger brother, Anders Sandöe Oerstedt, has distinguished himself by his writings on jurisprudence, polity, and moral philosophy. In art, Thorvaldsen's fame is such that the bare mention of his name is sufficient. With that of the great Danish sculptor, Thiele's name is in some measure associated, as that of his biographer and literary interpreter, by his two splendid folio volumes on the artist's life and works. In architecture, both Hansen (brother-in-law to Rahbek) and Malling have done much, and have introduced a better taste than formerly prevailed. The former has published his chief designs in a large folio work highly creditable to the Danish press.

The annexed tables of the deceased and of some of the living writers of Denmark, including also the names of one or two artists, will serve to complete this portion of our subject, as a useful accompaniment to it:—

Died.

1637. Arreboe, Anders (born 1587), 'Hexaemeron,' or 'Creation.'

1677. Bording, Andreas (born 1619).

1678. Broby, Erik Erikensen (Pontoppidan), (born 1616), natural history, &c.

1702. Syv, Peter (born 1631), 'Danish Grammar.'

1722. Sorterup, Jörgen, J., satirical poetry, &c.

1742. Reenberg, Töger (born 1656), fables, satires, &c.

1748. Gram, Hans, history and antiquities.

1750. Eilschov, Fred. Chr. (born 1725), philosophical pieces, &c.

1752. Falster, Christian (born 1690), satires.

1754. Holberg, Ludvig (born 1684), general literature, biography, history, comedy, satire, &c.

1764. Sneedorf, Jens S. (born 1732), periodical literature, &c.

1765. Tullin, Christ. B. (born 1728), ethic and descriptive poetry, lyrical do.

1765. Kraft, Jens (born 1720), logic and metaphysics, &c.

1770. Langebek, Jacob (born 1710), the 'Danish Library,' 'Danish Magazine,' &c.

1778. Möllmann, Bernh. (born 1702), history.

1781. Ewald, Johann (born 1743), lyric poetry, poetical drama, &c.

1783. Wessel, J. H. (born 1742), comedy and parody, tales, &c.

1783. Wibe, Joh., comedy.

1783. Bull, Johann (born 1739), didactic poetry, &c.

1784. Trojel, P. C. (born 1754), poetry.

1788. Weyer, Niels (born 1767), poetry.

1788. Biehl, Charl. Dorothea (born 1731), dramatic pieces.

1789. Luxdorf, B. Will. (born 1716).

1790. Wivet (born 1728), comedy.

1791. Fasting, Christian, poetry, epigrams, &c.

1793. Trojel, P. Magnus (born 1743), satires, &c.

1794. Storm, Edward (born 1749), ballad poetry, &c.

1794. Smith, Laurits (born 1753), divinity and moral philosophy.

1795. Rothe, Tyge (born 1731), didactic poetry, &c.

1796. Samsöe, Ole Joh. (born 1759), tragedy.

1798. Suhm, Peter Fred. (born 1728), history, &c.

1798. Birkner, Mich. Gottlob. (born 1756), distinguished as a classical prose writer.

Nineteenth Century.

1801. Juel, Professor Jens (born 1745), a celebrated portrait painter.

1802. Wiedeveld, Joh. (born 1731), eminent sculptor, and Thorvaldsen's master.

1803. Bast, Povel Dankel, poetry, epigrams, &c.

1804. Baden, Jacob (born 1735), philology, &c.

1807. Tode, J. Clemens (born 1736), comedies, fables, humorous pieces, &c.

1808. Guldberg, Ove (born 1731), comedy.

1809. Zoega, Jörgen (born 1756), Egyptian antiquities, &c.

1815. Bugge, Thos. (born 1740), astronomy and mathematics.

1815. Thorlacius, S. Thorsden (born 1741), northern antiquities and literature.

1817. Foersom, Peter (born 1776), translator of Shakspere.

1819. Bastholm, Christ. (born 1740), philosophy and morals, sermons, &c.

1821. Rein, Jonas, poetical tales, &c.

1821. Thaarup, Thos. (born 1749), lyric poetry, hymns, &c.

1821. Zetlitz, Jens (born 1761), satires, epistles, &c.

1821. Hasse, Laurits (born 1737), novelist.

1821. Pram, Christian (born 1756), 'Staerkodder,' poetry, drama, &c.

1823. Malling, Ove, history and biography.

1825. Bruun, Thos. Christ. (born 1750), satires, tales, &c.

1826. Baggesen, Jens (born 1764), poetry and miscellaneous works.

1828. Lorentzen, Chr. Aug. (born 1753), artist, painted the 'Holberg Gallery.'

1832. Heiberg, Pet. Andreas (born 1758), comedy, political essays, &c.

1832. Rask, Rasmus Christ. (born 1784), philology, grammar, Northern and Oriental languages.

1833. Treschov, Niels (born 1751), theology and moral philosophy.

1834. Moller, Jens (born 1779), history and theology.

1836. Rahbek, Knud Lyne (born 1760), general literature and criticism, biography, poetry, drama.

Living Writers, &c.

Born.

1759. Nyerup, Rasmus, literary history and biography, criticism, &c.

1770. Hornemann, Jens Wilken, botany.

1770. Thorvaldsen, Bertel (Albert), sculptor.

1775. Mynster, Jac. Pet., bishop of Zealand, pulpit eloquence and theology.

1777. Gebauer, Chr. Dav., celebrated animal painter.

1778. Kruse, Laurits, novelist.

1779. Möller, Jens, Dr., theology and literature.

1779. Oehlenschläger, Adam, poetry, drama, romance, &c.

1781. Bröndsted, P. O., classical archæology and geography.

1783. Molbech, Chr., literary history, criticism, &c.

1783. Grundtvig, Nic. F. S., history, poetry, northern mythology, and antiquities.

1783. Eckersberg, Chr. Will., eminent historical painter.

1784. Lindberg, J. Chr., controversial theology.

1789. Ingemann, Bern. Severin, epic poetry, historical romance, &c.

1789. Dahl, Joh. Chr., landscape-painter.

1791. Heiberg, Joh. Ludvig, son of P. A. H., distinguished dramatic writer.

1791. Hauch, Joh. Carsten, tragedies and romances.

1791. Petersen, M. N., Danish language and philology, history and antiquities.

1794. Hansen, Morits Chr., tragedy, novels, tales, and educational works.

1795. Rafn, Karl Chr., northern literature and antiquities.

1798. Hertz, Henrich, comedy, poetry, &c.
1805. Anderson. H. C, poetry, romance, &c.
Paludan-Müller, 'Dandserinden,' a comic poem, &c.
Wergeland, Hen. Arnold, poetry, drama.

Sweden.—Though the modern literature of Sweden developed itself more tardily than that of Denmark, its course was nearly the same; for, springing from one common stock, both nations were similar in genius and intellectual disposition. More remote from intercourse with other European nations than its neighbour and rival, Sweden retained not only more of the parent language, but for a considerable time more of the Scandinavian character in its oral poetry. The Scalds continued to recite their compositions at the court of the Swedish princes till about the middle of the thirteenth century, when the last Skald upon record was Sturle Thordson, in the reign of Berger Jarl. Notwithstanding almost the whole of the following period to the time of Gustavus Vasa was one of turbulence or oppression, a taste for poetry continued to manifest itself in the popular songs and traditions in rhyme, some of which have been collected by Geijer and Afzelius.* Compared with these authorless compositions, the productions of those who professed to cultivate literature, such as it then was, were feeble and tasteless. Books of monkish devotion, rude treatises on medicine, astronomy, and a few other sciences, as then understood, but overlaid with superstition and mysticism, together with chronicles in barbarous Latin, present only a picture of intellectual barrenness. No such luminaries as a Dante or a Chaucer arose, and the few names which history has handed down to us are little better than mere sounds and shadows.

One of the most celebrated, or rather, the least obscure, is Nicholas Hermanni, bishop of Linköping, who died in 1391, and was canonized in 1416. Besides some theological works, he wrote legends, and translated the Life of St. Ansgarius, the first Christian missionary who visited Sweden (829). Eric Olai, professor of theology at Upsala (died 1486), composed some psalms and canticles. Nearly two centuries before, or about 1308, Eufemia of Norway, grandmother of Magnus Smek, had caused the history of Alexander the Great, the romance of 'Flores and Blanzeflor,' and some other productions of a similar kind to be translated into Swedish verse. Yet for a long time Swedish literature is little more than a dreary blank. Even learning was scarcely cultivated, for though the university of Upsala was founded by Sten Sture in 1478, it languished through neglect and for want of teachers, and can hardly be said to have been effectively established till the time of Gustavus Adolphus (1621-24). Nevertheless, though Sweden continued to be greatly behind Denmark in this respect, printing was introduced into the former country some years earlier than into Denmark. A press was first set up at Upsala in 1476, another at Stockholm in 1482, and a third at Wadstena in 1490. Wadstena is noted for the convent of St. Brigitta, where her daughter St. Catherine died abbess of it in 1391, and where, a century later (1498), a nun named Ingrida wrote an epistle to her lover, which is considered to be the most elegant and correct specimen of the Swedish language of that period, and indeed superior to any which appeared for a long time after. This composition, so full of eloquence and genuine passion, and in which the sentiments of love and mystical devotion are intermingled, places Ingrida by the side of the more celebrated Heloisa.

With her patriot Vasa (1523-60), a new æra dawned upon Sweden. [GUSTAVUS ERICKSON.] That prince, who more truly deserves the epithet of 'great' than most on whom it has been bestowed, possessed much literary talent, and very superior powers of eloquence, although he had to contend with a language which was still rude and unpolished. He founded the royal library at Stockholm, established schools throughout the country, and favoured the doctrines of the Reformation, in which he was seconded by the chief scholars in the kingdom. Among those who more especially distinguished themselves by their zeal were the brothers Olaus and Lars or Laurentius Petri. The former, who had studied at Wittenberg, was made secretary of council by Gustavus, but afterwards fell into disgrace, and was even sentenced to death upon a charge of high treason, though he was eventually pardoned. Laurentius also studied at Wittenberg, and on his return was made professor of theology at Upsala, where he preached the principles of Luther to crowded congregations, notwithstanding he had been excommunicated by the council of Catholic clergy. This loyal and intrepid 'Apostle of the North,' as he was subsequently called, was made archbishop of the kingdom in 1531. As a writer his labours were very considerable; besides a number of theological treatises, he made almost an entire translation of the Bible, in which he was assisted by his brother Olaus, and upon which he was engaged at the time of his death in 1573.

The unfortunate Eric XIV. possessed a taste not only for literature, but for music and painting, which last he is said to have practised, and to have executed the whole-length portrait of himself, in the gallery at the castle of Gripsholm. In the succeeding reign (John III.) literature and the sciences were neglected for political and theological disputes; but in that of Charles IX. they began to revive. Charles himself may be placed among royal authors, for he wrote his own history in verse, and also many songs and other poetical pieces. We have here to consider Gustavus Adolphus not in his character of a warrior and a statesman, but in that of an encourager of the peaceful arts. He was himself gifted with more than ordinary powers of eloquence, and his address to the states (1620) may be considered a model of that oratory which at once appeals to the heart and the understanding. This prince also began to compose his own memoirs, which are scarcely less admirable for their style than interesting for their matter. Inseparably connected with the name of Gustavus Adolphus is that of Axel Oxenstierna (1583-1654), one of the most eminent statesmen of his own day or any other, and also a patron of letters.

The family of the Messenii is one of some note in the literary annals of Sweden at this period. Johannes Messenius the elder (1584-1637) conceived the plan of dramatising the history of Sweden in a series of fifty plays, six of which he completed. They have gone through several editions, but they show that he was not the rival though the contemporary of Shakspere. His own history is rather remarkable. Being accused of holding a secret and treasonable correspondence with Sigismund of Poland and the Jesuits, he and his family were sentenced to imprisonment for life, but were released after twenty years' confinement. His son Arnold and his grandson Johannes (who was born in prison, 1629), both possessed talents; and the former, who was appointed historiographer by Christina, wrote the history of Charles IX., and also of Sigismund, neither of which however was printed. If the younger Johannes had so far followed his father's example as to abstain from publishing, the fatal end of both might have been averted; but he produced a satire, when he was only eighteen, in which he reflected very severely not only upon the nobles, but the queen herself. The consequence was that he was brought to trial, and his father being also implicated in the charge, both perished on the scaffold.

Of Eric Tegel and Carl Carlson Gyllenhjelm it will be sufficient to say that the former was secretary to Charles IX., and wrote the history of Gustavus I. and Eric XIV.; of the other, that he was the natural son of Charles IX., and high admiral of Sweden, and published in 1632 a work against the doctrines of the Roman Catholics ('Katholicismens Villomeningar'). Jöran or George Stjernhjelm, ennobled by Gustavus Adolphus, and patronised by Christina, enjoyed considerable reputation as a poet, in which capacity he furnished the ballets or masques which were then in vogue at court. The production by which he is now chiefly known is his 'Hercules,' a sort of didactic poem in hexameter verse, which though not without merit in regard to style and versification, displays more of ingenious argumentative talent than of poetical power. Nevertheless it was well entitled to the admiration which it received from his contemporaries. Stjernhjelm was well read both in antient and modern literature, had visited different countries, and acquired several languages. Nor did he confine his studies to poetry, for he published the 'Codex Argenteus,' with a translation. His contemporaries Rosenhane and Spegel distinguished themselves—the one by his sonnets, in which he showed himself a disciple of Ronsard; while the other was, like Arreboe, the Danish poet, an imitator of Du Bartas. Spegel also compiled a dictionary of the Swedish language, which was afterwards greatly extended by Ihre.

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* 'Svenska Folkvisor,' 3 vols. 8vo., 1814. The two first volumes of a similar collection, by Arwidsson, have since appeared under the title of 'Svenska Fornsanger.' J. E. Rydquist has also made an interesting contribution to literary archæology in his 'Nordens aldsta Skadespel,' on the dramatic songs and compositions of the Swedes, similar to those of Iceland and Finland.

Among the literary men of the seventeenth century, Olof Rudbeck, both the father and son of that name, deservedly rank high. The elder Rudbeck has left a monument of extraordinary erudition, but also of wild and extravagant hypotheses, in his 'Atlantis' (4 fols. fol.). With them may be mentioned the two Perinskiolds, who revived the study of Icelandic literature. John, the father, translated from that language Snorre Sturleson's 'History,' and many beautiful Northern traditions, in a simple and elegant style; and Frederic was likewise an able antiquary and diligent labourer in the same field. Another remarkable contemporary instance of family talent on the part of father and son occurs in the older and younger Nicodemus Tessin, both of whom ranked among the first-rate architects of their time. Nor was the grandson, Count Carl Gustavus Tessin, with whom the title expired in 1770, less esteemed for his taste and ability as an architect, beside his merit as a writer.

The commencement of the eighteenth century was by no means propitious to literature in Sweden. The age of laborious erudition had passed away, that of the belles-lettres can scarcely be said to have begun before the reign of Gustavus III. Still one or two names of note occur during the first half of the century. Even were there no other than that of Olof von Dalin, it would suffice to vindicate the national taste at this period, he being not undeservedly regarded as the Swedish Addison. Like his prototype, he not only set the example of a more graceful and polished prose style, but sought to entertain while he instructed, to improve while he amused his readers. The 'Svenska Argus' (begun in 1733, when the writer was only twenty-four) obtained as marked success as the English 'Spectator.' Nor was the interest on the part of the public diminished by the name of the writer remaining unknown for three years. There is another point of resemblance between the Swedish and the English essayist,—neither of them shone in conversation, or displayed in it any of those graces which adorn their writings; both, again, tried their ability in the drama, although neither the 'Cato' of the one nor the 'Brynilda' of the other manifests any tragic power. Dalin succeeded better in comedy. His 'Svenska Friheten' was greatly admired in its day, but that and his other poems have now fallen very much in estimation, which is also the case with his 'History of Sweden,' a work that added much to the author's reputation, as being popular and captivating in its style, but its real value is now almost destroyed by the more recent histories of Geijer, Fryxell, and Strinnholm.

To the same epoch with Dalin belongs Madame Nordenflycht, who was regarded almost as a prodigy of learning in her sex, and whose elegies and other poems occasionally display real feeling and talent, though they are for the most part in a false taste, and disfigured by affectation. The fame of this lady was not confined to Sweden, for her literary acquaintance was cultivated by correspondents in other countries, and among the rest by Haller, Fontenelle, and Holberg. It was she who instituted, in 1753, the Society which assumed the title of 'Utile Dulci,' and which enrolled Counts Creutz and Gyllenborg, and other followers or patrons of literature among its members. To another female, Louisa Ulrica, the queen of Adolphus-Frederick, who not only patronised, but also cultivated scientific and literary pursuits, Sweden is indebted for the establishment of the Academy of Stockholm (1757). About the same time other literary societies began to spring up, such as the 'Apollini Sacra' at Upsala, and the 'Aurora' at Abo. These institutions undoubtedly served to encourage literature; but it is very questionable whether they were not also injurious to it, by dictating formal rules, and a submission to pedantic theories of criticism. Considered in this latter point of view, even the otherwise splendid period of Gustavus III. (1772-92) is not altogether exempt from reproach. That illustrious patron of literature and art, who, unlike Louis XIV., distinguished himself not only by encouraging talent in others, but by the display of it in himself—who, while he munificently patronised the muses as a sovereign, enrolled himself among their votaries, was unfortunately prepossessed in favour of French models. Hence the literature of his time bears more of a French than a national physiognomy. Nevertheless much good was effected, by an impulse being then given, which afterwards took a better direction. Besides reorganising the Swedish Academy of Stockholm (1786), Gustavus established several other institutions, and liberally supported the two universities of Upsala and Lund; and although his literary taste was French, he exerted himself very much in behalf of the Swedish language.

From the commencement of his reign the names of literary persons begin to be so numerous, that it is difficult to include all of them within the compass of a mere sketch. There is no occasion for our speaking at all of Linnæus, both because his fame does not exactly belong to literature so called, and because his life and writings have been treated of in another place. [LINNÆUS.] We turn to the more obscure name of Olof Rudbeck, which would perhaps have been less so than it now is, had he not died prematurely. He displayed considerable originality and talent for the comic epic in his 'Boräsiade,' a poem in four cantos, describing the heroic contest between the citizens of the town of Boräs, under their burgomaster, and the desperate rebel Hofmann. The two noble writers Counts Creutz and Gyllenborg may be placed together, notwithstanding the latter survived the other upwards of twenty years, as being not only attached friends, but literary associates. Creutz's 'Atis och Camilla,' a descriptive poem in five cantos, is considered the best work of its kind in the language; while, if not entitled to rank as an epic, Gyllenborg's 'Täget ofver Belt' displays much vigour of imagination and happy execution. The last-mentioned writer produced also some dramatic pieces; and as a fabulist he stands decidedly at the head of his countrymen. Celsius, bishop of Lund, was the biographer, or rather, the historian of Gustavus Vasa and Eric XIV., in two different works; and he also took the first prince as the subject of an heroic poem in seven books; but in this department he showed himself greatly inferior to Gyllenborg. He also wrote a tragedy called 'Ingeborg.'

We now come to one who though he cultivated only a minor department of poetry, manifested in it a power and originality that place him far above those who are chiefly skilful imitators of standard models—to Bellman, who is generally styled the Swedish Anacreon, a title that detracts almost as much as it compliments, for he has borrowed nothing from the antient bard. A strong vein of nationality and racy humour pervades all his principal productions—his 'Fredman's Epistles,' his songs, &c., which rendered him at once the favourite of all classes. As he wrote so he lived, as he lived so he died—a staunch devotee to Bacchus; for it is related of him, that finding his end approaching, he invited some of his companions to partake a farewell revel, at the close of which he bade adieu for ever to song and wine.

In some respects Lidner was quite opposite to Bellman, and in others greatly resembled him. Nothing can be more unlike the gay and joyous effusions of the one than the sombre, plaintive, and touching strains of the other; but the love of wine was the same in both, or rather Lidner carried it to a degree of coarse intemperance not palliated by any joviality of temperament. He was indeed one of those who seem voluntarily to doom themselves to misery and degradation; for his conduct was so thoroughly reckless, so devoid of all ordinary prudence, as to frustrate the benevolent intentions of Gustavus, his royal patron, and to render every attempt of his friends to serve him utterly unavailing. Nevertheless, with all his follies and vices as a man, with all his imperfections as a writer, Lidner possessed that spark of genius which still recommends his poetry, while so many contemporary productions, applauded and extolled in their day, are now forgotten.

Among those literary men who enjoyed in a particular degree the personal favour of Gustavus, was Kollgren, who if not a great was a pleasing poet, full of ingenious and happily expressed ideas, set off to advantage by the elegance and harmoniousness of his versification. Both by his lyrical pieces and his satires he rendered himself deservedly a favourite with the nation; and he is still read with satisfaction, notwithstanding he has too much of the affected polish and refinement of the school then in vogue, and too little of that freshness and vigour which mark some of the writers of a later period. His successor at the Swedish Academy, Stenhammer, distinguished his brief career by his ode on the battle of Svensksand, and a poem on the importance of religion to states, both which are masterpieces of their kind. He also commenced a parody of the 'Æneid.' Magnus Lehnberg advanced pulpit eloquence very far beyond any of his predecessors in Sweden; the sermons of Bäld, Tolesson, and others, which had previously been regarded as first-rate compositions of that class, rendered the superiority of Lemberg's the more evident. Thorild, the literary antagonist of Kellgren, distinguished himself scarcely less as the zealous but unsuccessful champion of the liberty of the press than as a writer: he rendered himself so obnoxious to the government in the former character, that he was obliged to seek an asylum in Denmark. Among his poems that on the Passions is esteemed the best, but his more important productions are in prose, and show him to have been a profound thinker and a dealer in ingenious paradoxes. Professor Hoijer was also an able writer on subjects of philosophy, æsthetics, and criticism, which he treated in a masterly and eloquent style, and with great clearness.

Axel Silfverstolpe, chamberlain to Queen Sophia Magdalena, and Count Oxenstierna, who emulated the example of his uncle Count Gyllenborg, both possessed literary talent; and if the former did not shine as a poet of the first class, he produced several agreeable and elegant pieces. More ambitious, Oxenstierna showed himself to be also more favoured by the muses: his descriptive poem, in nine books, entitled 'Skördarne,' or Harvest, and his 'Dagens-Stunder,' rank among the best productions of their kind in the language, as well on account of the imagination which they display, as for the beauty of the expression.

Madame Lenngren (daughter of Professor Malmstedt of Upsala) manifested a peculiar vein of poetry, adorning familiar subjects with the simple graces of nature and truth, and observing a happy medium between affected refinement and vulgar literal reality. Her 'Grefvinnans Besök' (Visit to the Parsonage), 'Den Glada Festen,' and 'Porträtterne,' are so many charming pictures of domestic life, delightful from their freshness and their truth, and also for a certain tone of ingenuous and delicate satire. The Swedish Academy honoured her memory by a medal, on the obverse of which is her bust, and on the reverse a muse holding a lyre, with this inscription: 'Quo minus gloriam petebat eo magis assecuta.' With this amiable woman we may here be allowed to make brief mention of two other literary females, not having been able to ascertain when they died or whether they be yet living, namely, the Baroness d'Albedyhl and Madame Berger (born Countess of Cronhjelm), the former of whom published 'Gefion' (Upsala, 1814), a little epic poem in four cantos, and has been styled the Swedish Sevigné for the elegance of her epistolary style; the other has acquired some reputation both as a novelist and a poetess, especially by her 'Capriciosa,' a charming tale in verse. To these may further be added Madame Nyberg, known to the public under the name of Euphrosyne, whose poems display both fancy and feeling with much beauty of language. She is a disciple of the new romantic or Phosphorist school, and her manner bears some resemblance to Atterbom's, in whose 'Almanack of the Muses,' for 1822, there is a dramatic poem by her, founded on the legend of St. Christopher. Deviating somewhat from the order in which their names occur in the table at the end of this article, we will here, for convenience sake, group together Adlerbeth, Leopold, and some other writers, before we mention Stagnelius, Vitalis, and Nicander, who may be considered as more particularly belonging to the *Phosphorists*, or new romantic school, as opposed to the *Classicalists*. In his original poems, particularly in his Epistles, Baron d'Adlerbeth shows himself an amiable moralist and philosopher, but his tragedies are merely correct lifeless productions carefully modelled according to French dramatic rules. He also translated Virgil, Horace, and the 'Metamorphoses' of Ovid. Edelcrantz, who, previously to his being ennobled by the title of baron in 1789, was called Clewberg, first attracted notice by his *Eloge* on Louisa Ulrica, which eloquent composition obtained for him the place of librarian at the university of Abo. Another much superior production of his is the 'Ode till Svenska Folket;' his merit however lay not so much in what he himself did as a writer, as in the services which he rendered to art and science, manufactures, commerce, and agriculture. He first introduced the telegraph and the steam-engine into Sweden, and he kept up a correspondence with the most distinguished scientific persons in different parts of Europe, including our own countrymen Sir John Sinclair and Sir Humphry Davy. He was also perpetual president of the Academy of Painting and Sculpture.

The veteran Leopold, whose career extended through so long a period, was looked up to as the leader of the classical or French school of literature, which was in fashion under Gustavus III. at the beginning of the present century. He has sometimes been called the Voltaire of Sweden—not that he resembled Voltaire in character—and his tragedies have been greatly extolled; but, like his models, they are cold and declamatory, with little of real passion or poetry, though abounding with splendid rhetoric. The same may be said of his Odes, one of which, 'Begäret till ett udödligt Namn,' has been translated in the sixth volume of the 'Foreign Quarterly Review.' He succeeded better in his tales and satires, to which latter kind of composition his talent was well enough suited, and there his polished elegance and sententiousness are in their place. As a prose writer he is deservedly considered a model of style.

Hammarskjold produced several interesting works on subjects of literary criticism, and among others one on the character of Schiller as a poet, historian, and philosopher (1807); also a series of lectures on the history of literature and the fine arts in Sweden (1818-19). Stjernstolpe is mentioned elsewhere. [STJERNSTOLPE.] Stagnelius, Vitalis, and Nicander all belonged to the new school; all possessed strong poetical power, and all died in the prime of life. Stagnelius, the most highly gifted of the three, whose literary career commenced in 1812 and was closed in less than twelve years, has been described as possessing a truly poetic nature, and as resembling the mystic German Novalis. His works, comprised in three volumes, consist of 'Vladimir,' 'Blenda,' 'Gunlög,' and fragments of two other epic poems, tragedies and other dramatic pieces, and his lyrical and miscellaneous compositions. Finely touched as his productions of that class are, the peculiar turn of his genius in a great measure disqualified him for succeeding in the epic and the drama. He had too much of what the Germans call *subjectivity*, and he accordingly was always displaying his own feelings and sentiments, instead of identifying himself with his characters. He therefore pleases better—we might say, completely satisfies in such a dramatised poem as that of the 'Martyrs,' in which religious enthusiasm and Christian fortitude are depicted in the most sublime strain of poetry. After all it is as a lyric poet that he excels; the finest passages in his tragedies and his epics are all of a lyrical cast; and among his lyrics the series of religious pieces entitled 'The Lilies of Sharon' are preeminent, and would of themselves have secured for him a place among the highest order of poets. Eric Sjöberg, better known under the assumed name of Vitalis, was one of those who, highly favoured with natural gifts, have been the outcasts of fortune. His whole life was one of struggle, privation, and hardships; and he closed it within the walls of a public hospital. As a writer he has sometimes been classed among those whose power lay in comic humour; yet although flashes of mirth and satiric pleasantry occasionally occur in his poems, the pervading character of most of them is melancholy and tenderness, and a weariness of spirit longing to be at rest. He was indeed very unequal, often pathetic and sublime, sometimes even below mediocrity. As to Nicander, we may refer to a previous article [NICANDER], merely remarking that while his poetry manifests strong fancy and deep enthusiasm, it is not free from occasional extravagance or from marks of negligence. Wallin, archbishop of Upsala, who died lately, acquired well merited popularity both as a preacher and a poet. His sermons and discourses are noble specimens of pulpit eloquence, nor was his delivery less impressive. Nearly all his poetical productions are of a devotional cast, and his psalms have been generally adopted throughout Sweden.

Among the living poets and literary men of Sweden, Franzen may be allowed to take precedence according to seniority, if not altogether according to reputation; for in the latter respect the first place incontestibly belongs to Tegner, bishop of Wexiö. The reputation of the bishop of Hörnesand (Franzen) however is not very much inferior to that of the bishop of Wexiö; he was one of the first who broke away from the factitious style in which mechanical excellence was chiefly regarded, and who strove to render poetry the interpreter of the mind. His lyrical and elegiac compositions are very numerous, and are decidedly his best: they seem spontaneous effusions replete with the eloquence of the heart. In his longer poems he was far less happy; that in twenty cantos for instance, on the marriage of Gustavus Vasa, is both monotonous and deficient in the interest requisite for so long a narrative. 'Columbus,' another historical poem, published in 1831, but not yet finished, has not added much to his fame; neither has he succeeded much better in tragedy. Notwithstanding these deductions, he is certainly a master within his own peculiar sphere, and is also an admirable prose writer. His popularity is beyond all question; and if it be true, as has been stated, that of one edition of his poems 3000 copies were sold within a single week, it is a circumstance almost unparalleled, not numerically, but in proportion to the population of the country, to which alone the demand for books in the language may be said to be confined.

Ling may be considered in some respects as the Swedish Oehlenschläger, for, like the Dane, he has *Scandinavianised* the drama of his country, taking the subjects of his tragedies, or rather dramatic poems, from the antient northern mythology and legends. One of his principal productions, 'Gylfe,' is a sort of modern history of Sweden disguised under a mythological mask, but, as it has been observed, an allegory extended to fifteen cantos and as many thousand lines must not expect to meet with many readers—certainly with none among strangers.

Esaias Tegner is universally recognised as the poet of Sweden; the one who stands pre-eminent in the affections of the nation and in the esteem of foreigners. His reputation has extended itself where even the existence of Swedish literature was scarcely known before; his 'Frithiöf's Saga' has found more than one translator both in Germany and in England; and anecdotes are told of persons learning the language merely in order to be able to read it in the original. Added to all which, he is one of those upon whom, like Göthe and Schiller, volumes of criticism have been written. To sum up his literary character as briefly as possible, it may be observed that Tegner has not displayed poetic invention: his 'Frithiöf' is no more than a reproduction of the antient Icelandic 'Saga;' still he possesses the art of bestowing an inexpressible charm on whatever he touches. His language is most harmonious, his colouring most pleasing, and he always shows himself a genuine son of the North. Hence his great popularity is accounted for; since popularity does not fall to the share of the greatest poet or artist, but rather to him who can interest the greatest number. We pass over 'Axel,' and Tegner's other productions, which have been frequently mentioned in various journals both English and foreign.

Professor E. G. Geijer has done very much for the study of northern history, literature, poetry, and mythology. His 'Svea Rikes Häfder,' or 'Records of Sweden,' is an excellent work, whose intrinsic merits are set off by a felicitous style. The same writer has also produced a 'History of the Swedish Nation,' and a history of Sweden from 1719 to 1772. Afzelius, a relation of Adam Afzelius the botanist, and John Afzelius the chemist, who joined with Geijer in editing a collection of 'Folkvisor,' or antient national ballads, is also known as an historian and literary antiquary. His translation of the 'Elder' or 'Sämand's Edda,' is greatly esteemed; nor is he without reputation as a poet. After Tegner, Atterbom's name is the one more generally known beyond Sweden as that of one who has distinguished himself in poetry. A warm partizan, indeed one of the founders of the modern or romantic school, he took an active share in the warfare between that and the classical one, as editor of the journal 'Phosphorus' (1810-13), from which the title of Phosphorists has been given to that literary party. He has likewise rendered great service to Swedish literature by his 'Poetical Almanac' (commenced in 1812), which has from time to time been the means of introducing to the public many able writers. In 1817-18 he visited Germany and Italy, and on his return was appointed tutor to the crown-prince Oscar in German poetry and literature. A few years later (1824-27) he confirmed his previous fame and popularity by his 'Lycksalighetens ö' (the Island of the Blest), a 'sagospel,' or romantic poem, in 'five adventures;' for the story of which fanciful fairy allegory we refer to the account given of it in the second volume of the 'Foreign Review.' Notwithstanding this production—whose colouring is in many parts of southern luxuriance—increased the number of Atterbom's admirers, it has not escaped critical censure on the score of insipid and exaggerated sentimentality, while on the other hand it has been characterised by Nicander as a splendid lyrical panorama. Among his other poems the romantic tale of the 'Blue Bird' is one of the most popular. He is also esteemed as a prose writer, and his discourse on the death of Kernell (1824), a young man of great talent, is considered a highly affecting piece of eloquence. His 'Letters from Rome,' addressed to Geijer, and published in the journal 'Svea,' are highly interesting, both on account of the criticism which they display and the information which they give relative to many living artists of the German school. A German translation of all his poems, by Gottlieb Mohnicke, appeared in 1840.

On those who yet remain to be spoken of we can bestow scarcely any further notice than what is supplied by the annexed table; nor do the names there given as those of living writers by any means include all who are entitled to honourable mention, but it is as yet difficult to collect any particulars respecting them, some of them having only recently become known as writers.

There is one department of literature, we may observe, in which Sweden now possesses some original productions of ability and merit, although it was scarcely cultivated at all till within the last twenty years—namely, that of prose fiction and the novel. Nearly all Scott's historical romances have been translated, and they have had a considerable influence in creating a taste for this species of reading. Frederick Cederborg, who began his career somewhat earlier, has distinguished himself by several productions of the kind, fraught with humour and abounding with comic scenes. Livijn's 'Spader Dame' and other novels display an originality and power, a strength both in their humorous and their pathetic parts, which have seldom been equalled. The modern novel has been treated with great success by Frederica Bremer; and Baroness Knorring has been happy in her delineations of the gay and fashionable world; while Engström has produced some interesting pictures of country life and manners. In the fine arts Sweden can boast of some distinguished names: those of Bystrom and Göthe in sculpture would do honour to any nation.

Died.

1636. Tegel, Eric, history.
1637. Messenius, Joh. (born 1584), drama.
1650. Gyllenhjelm, Carl (born 1574), poetry.
1672. Stjernhjelm, Jöran (born 1598), poetry, antiquities.
1698. Ehrenstrahl, David, K. (born 1629), painter.
1702. Rudbeck, Olof, Elder (born 1630).
1714. Spegel, Haqum, Archbishop (born 1645), poem on the creation, 'Paradiset,' psalms, &c.
1728. Tessin, Count N., Younger (born 1654), architect
1743. Triewald, Sam. (born 1688), satires, &c.
1744. Celsius, Anders (born 1700), astronomy, &c.
1763. Dalin, Olof (born 1708), history, poetry, &c.
1763. Mörk, Jac. Hen. (born 1714), novels, &c.
1763. Nordenflycht, Hedwig Charlotte (born 1718), poetry.
1770. Tessin, C. Carl Gustaf (born 1697), architecture, literature, &c.
1777. Rudbeck, Olof (born 1756), heroic-comic poetry.
1778. Linnæus, Carl (born 1707), botany, &c.
1780. Ihre, Joh. (born 1707), philology and antiquities.
1785. Creutz, Count Gust., poetry.
1790. Botin, A. V. (born 1724), history, &c.
1793. Lidner, Bened. (born 1769), poetry.
1794. Celsius, Olof, bishop of Lund (born 1716), 'Gustavus Vasa,' an heroic poem; tragedies.
1795. Bellman, Carl M. (born 1745), poetry, songs, &c.
1795. Kellgren, Joh. Hen. (born 1751), satires.
1799. Stenhammar, Joh. (born 1769), poetical tales, &c.
1800. Boethius, Dan., moral philosophy, &c.
1801. Hiernöe, Joh. (born 1718), sculptor and architect.
1807. Lehnberg, Magnus, Bishop, sermons.
1808. Gyllenborg, Count Gust. (born 1731), poetry.
1808. Thorild, Thos. (born 1759), poetry, philosophy, politics.
1810. Elqstrom, Pehr, poetry.
1812. Hoijer, Prof. Benj. C. H. (born 1757), philosophy, æsthetics, &c.
1814. Sergell, Tobias (born 1740), eminent sculptor.
1815. Lindegren, Carl, comedy, elegiac poetry, &c.
1816. Silferstolpe, Axel Gabr., poetry, translations, &c.
1816. Hörberg, Pehr (born 1746), historical painter.
1817. Lenngren, Anna Maria (born 1754), poetry.
1818. Adlerbeth, Baron d', Gudmund, tragedies, &c.
1818. Oxenstjerna, Count (born 1750), poetry and oratory.
1820. Torneblad, Bengt. Jon., political pieces, &c.
1821. Edelkrantz, Baron, poetry, fine arts, science.
1821. Wahlberg, Carl Gust., novelist.
1823. Stagnelius, Eric Joh. (born 1793), epic poetry, &c.
1824. Silferstolpe, G. A. (born 1772), history and geog.
1824 (about). Rosenstein, Nils (born 1752), poetry, &c.
1827. Biberg, philosophy.

1827. Thunberg, C. P. (born 1742), natural history, &c.
1827. Hammarskiold, Lorenz (born 1785), criticism, &c.
1828. Sjöberg, Eric (Vitalis), (born 1794), poetry.
1829. Leopold, Carl Gust. (born 1756), tragedies, lyric poetry, &c.
1829. Ödmann, Samuel (born 1750), theology, &c.
1831. Stjernstolpe, Joh. Magnus (born 1777), poetry.
1837. Afzelius, Adam (born 1750), natural history.
1837. Afzelius, Joh. (born 1753), chemistry.
1839. Rudberg, Prof. Fred. (born 1800), physical sciences.
1839. Nicander, Carl A. (born 1799), poetry.
1839. Wallin, Olof, Archbishop (born 1779), religious poetry, &c.
1839. Fries, Elias (born 1794), botany, philosophy, &c.

Living Writers, &c.

Born.
1760. Adlersparre, Georg., history, statistics, military science, general literature.
1772. Franzen, Frans Mich., Bishop, poetry.
1771. Fahlcrantz, Carl Joh., landscape painter.
1776. Ling, Pehr, epic poetry, history.
1779. Goethe, Gust., sculptor.
1779. Berzelius, Jacob, chemistry and physical sciences.
1781. Wingard, Carl Fred., Archbishop, theology, &c.
1782. Tegner, Esaias, bishop of Wexiö, poetry, &c.
1783. Bystrom, Joh. Nich., sculptor.
1783. Geijer, Eric Gust., history, lyric poetry, &c.
1785. Afzelius, Arvid Aug., poetry.
1788. Palmblad, Wilh. Fred, biography, geography, poetry, tales, &c.
1790. Atterbom, Dan. Amadeus, distinguished poet.
1790. Fahlcrantz, Chr. Eric, humorous poetry.
1791. Lundblad, Joh. Fred., 'Svensk Plutark.'
1791. Dahlgren, Carl J., humorous poetry, tales, &c.
1794. Ahlquist, Abr., archæology, history, botany.
1795. Fryxell, Anders, history, poetry.
1796. Beskow, Bernh., drama and poetry.
1800. Wahlberg, Pehr Fred., botany, medicine, &c.
1802. Bremer, Frederika, novelist.
1807. Böttiger, Carl Wilh., poetry.
* Fogelberg, Bengt Erland, sculptor.
* Runeberg, Joh. Ludvig, epic poetry, idylls, &c.

SCANDIX (from *σκάνδιξ*), the name of a genus of plants belonging to the natural order Umbelliferæ. It is known by the margin of its calyx being obsolete or obscurely 5-toothed; petals obovate, emarginate, and mostly furnished with an inflexed point; fruit with a very long beak, separable into two parts, each with 5 blunt equal ribs, the furrows without vittæ; seed squarely convex, with a deep furrow in front. This genus is composed of annual herbs, with square rather striated stems, bi-pinnate leaves, the leaflets divided into linear lobes. The umbels have few rays. The involucra are wanting or composed of one leaf. One of the species, *S. pecten veneris*, the common Shepherd's Needle, or Needle Chervil, is a native of Europe and the North of Africa, and is very plentiful in the cultivated fields of Britain. It is known by its involucels possessing jagged leaves, and its nearly smooth fruit with a bristly-edged beak. It possesses slightly acrid and aromatic qualities, and is supposed to be the Scandix of Dioscorides, which was used as a potherb by the Greeks. One of the species of this genus, *S. cerefolium*, the garden chervil, which is now referred to the genus Anthriscus, was formerly much cultivated in gardens, and was recommended by Geoffroi and Haller as a medicine in dropsy, hæmorrhoids, and other diseases. It is used in France as a salad, and in Holland as a potherb, but is not in much repute in this country. It is known by its twice-pinnate leaves, with channelled footstalks, stem slightly hairy at the joints, umbels sessile, either axillary or opposite the leaves; fruit somewhat furrowed, not ribbed, smooth. It is a native of the South of Europe, and though common in some parts of Great Britain, is probably an outcast from gardens.

SCANIA. [SWEDEN.]

SCANSO'RES, Mr. Vigors's name for an order of birds comprising the families RAMPHASTIDÆ, PSITTACIDÆ, Picidæ [WOODPECKERS], Certhiadæ [CREEPER], and CUCULIDÆ. (*Linn. Trans.*, vol. xiv.)

Mr. Swainson also makes the *Tribe Scansores* consist of the families *Ramphastidæ*, *Psittacidæ*, *Picidæ*, *Certhiadæ*, and *Cuculidæ*. (*Classification of Birds*, vol. ii.)

The Prince of Canino arranges under the tribe Scansores the families *Psittacidæ*, *Picidæ*, and *Cuculidæ*. (*Birds of Europe and North America.*)

Mr. G. R. Gray makes the order *Scansores* consist of the *Ramphastidæ*, the *Psittacidæ*, the *Picidæ*, and the *Cuculidæ*.

SCANTLING, a term used by carpenters to express the transverse dimensions of a piece of timber; and also, in some cases, as a general name for small timbers, such as the quartering for a partition, rafters, purlins, or pole-plates in a roof, &c. All quartering or squared timber under five inches square is designated scantling.

In masonry the same word is used to express the size of stones in length, breadth, and thickness.

SCAPEGOAT, or AZAZEL (עֲזָאזֵל). On the great day of atonement among the Jews, the high-priest was to choose two goats, and after presenting them before the Lord at the door of the tabernacle, he was to cast lots upon them, one lot being for the Lord, and the other 'for Azazel.' The one upon which the Lord's lot fell was to be sacrificed as a sin offering, and the other was to be presented alive before the Lord to make an atonement with him, which was done by the high-priest laying both his hands on the head of the goat, and confessing over him the sins of all the people, which were thus said to be 'put upon the head of the goat.' The goat was then to be sent away into the wilderness by the hand of a fit man, who was to let him go in the wilderness. (*Levit.*, xvi. 8-28.) According to the Rabbins, the goats were placed before the high-priest, one on his right hand and the other on his left, who then drew out of an urn with his two hands two lots, the one inscribed 'for the Lord,' and the other 'for Azazel,' and the fate of each goat was determined by the lot that appeared in the hand before which he stood. It was considered a favourable omen when the lot 'for the Lord' appeared in the high-priest's right hand. The high-priest then fastened a long narrow fillet of scarlet to the head of the scapegoat, and after confessing his own sins and those of the people over him, he sent him away. If the atonement was accepted, the fillet on the goat's head, as the Rabbins say, turned white; and to this circumstance they understand Isaiah to allude in those words, 'Though your sins be as scarlet, they shall be white as snow' (i. 18). The goat was then carried to a desert place (in the time of the Temple), about twelve miles from Jerusalem, where, instead of being set at liberty (*Levit.*, xvi. 22), it was thrown down a precipice, and thus dashed to pieces. This consummation of the sacrifice was communicated by signals to the people assembled at the Temple, when another token of the divine acceptance was given by a crimson fillet which was tied on the Temple door turning white. It is added that the usual tokens of the divine approbation ceased about the time of the death of Christ. (Lightfoot's *Works*, vol. ix., p. 173-180; x. 75,104-5, ed. Pitman.) The typical import of this ceremony, namely, that Christ *bears away* the sins of men, seems to be referred to by Isaiah (liii. 11, 12), and in the following passages of the New Testament (*John*, i. 29; *Heb.*, ix. 28; 1 *Pet.*, ii. 24).

The meaning of the word *Azazel* is very doubtful. It seems to be derived from a root (which still exists in Arabic) meaning *to separate*. 1. The common interpretation refers it to the goat itself as being *sent away*. 2. Some take it to be the place to which the goat was sent, as being either a proper name, or merely a general term for a *separate place* or wilderness. 3. Spencer and most of the German critics consider it to be the name of an evil spirit, who was supposed to inhabit desert places; and they would translate *Levit.* xvi. 10, 'to let him go *to Azazel* (instead of, *for a scapegoat*) into the wilderness.' These three explanations are discussed in Jennings's 'Jewish Antiquities' (b. iii., c. 8), who has pointed out formidable objections to the last view, and especially the close resemblance which the ceremony so explained bears to that worship of devils which was expressly forbidden by the Mosaic law (*Levit.*, xvii. 7). The best explanation appears to be that of Winer (*Biblisches Realwörterbuch*, art. 'Versöhnungstag'), who understands the word, with the prefix which is attached to it each time that it is used, to mean *for a separation* or *putting away*, namely, of the sins of the people.

(Calmet, arts. 'Azazel' and 'Expiation;' Spencer, *De Leg. Hebraeor.*; Bochart, *Hierozoicon*; Jahn, *Archæol. Bibl.*; Rosenmüller, *Scholia*, *Levit.* xvi.)

SCAPHIDURI'NÆ. [STERNIDÆ.]

SCAPOLITE, *Chelmsfordite*, *Paranthine*, *Wernerite*, occurs crystallized and massive. Primary form a square prism. Cleavage parallel to the lateral faces and the dia gonal planes of the primary form. Fracture uneven, conchoidal. Hardness, easily scratches fluor spar and sometimes apatite. Colour white, grey, green, reddish, violet. Lustre vitreous; translucent, opaque. Specific gravity from 2·612 to 2·724. When strongly heated by the blowpipe it swells up and fuses into a brilliant white enamel. Scapolite occurs in Sweden, Norway, Finnland, and North America.

Analysis of the mineral from Pargas by Nordenskiold:—

Silica . .	43·83
Alumina . .	35·43
Lime . .	18·96
Water . .	1·03
	99·25

SCAPTEIRA, Fitzinger's name for a genus of *Pristidactyle Cœlodont Saurians* (*Lucertian* or *Autosaur Lizards*) of Duméril and Bibron.

Generic Character.—Tongue of an arrow-head shape, with no sheath at the base, moderately long, notched at the anterior extremity, covered with imbricated squamiform papillæ. Intermaxillary teeth conical, simple. Maxillary teeth slightly compressed; the first simple, the succeeding teeth tricuspidate. Nostrils lateral, circumscribed by three convex plates—one naso-rostral, two naso-frenal. Eyelids. Tympanic membrane stretched within the auricular border. A fold of the skin in front of the breast. Lamellæ on the belly. Femoral pores. Feet terminated each by five flattened toes, which are smooth below, but dentilated laterally. Tail cyclo-tetragonal at its root, rounded throughout the rest of its extent.

Example, *Scapteira grammica.*

Description.—Greyish white, washed with greenish on the upper parts. The cranium and the temples sprinkled with black specks. Other black specks, but finer and more numerous, are spread upon the neck, the back, and the sides, and united to each other by delicate lines still more fine. Some small black dashes are scattered on the base of the tail. The upper part of the limbs dotted (piqueté) with black: all the lower parts white.

Locality.—Africa (Nubia). (Dum. and Bibr.)

SCA'PULA. [SKELETON.]

SCA'PULA, JOHN, was probably a native of Lausanne. He lived during the latter half of the sixteenth and the commencement of the seventeenth century, and at one period of his life he was employed at Paris in the printing establishment of Henry Stephens. The time of his death is unknown, but it is probable that in the year 1612 he was still alive. Scapula is only known as the editor of a Greek dictionary, which, instead of gaining him credit, has drawn upon him the just and severe censure of all honest men. He was employed by Stephens at the time when that great scholar was printing his 'Thesaurus Linguæ Græcæ,' which was published in 1572. After the publication of that work, Scapula appears to have left his employer, for in 1579 he published at Basel a 'Lexicon Græco-Latinum,' fol. This dictionary is in fact only an extract from or abridgement of the great work of Stephens. The sale of the 'Thesaurus' was of course greatly diminished by the publication of an abridgement, and Stephens, who had spent almost all that he possessed upon his work, became involved in considerable difficulties. Scapula did not even acknowledge what he had done; on the contrary, he constantly endeavoured to conceal the source from which he had drawn. Some of his biographers have asserted that Scapula published his dictionary while the 'Thesaurus' was printing, an assertion which is wholly unfounded, for there is no edition earlier than that of 1579. Though Scapula injured Stephens, he did a great service to those students who could not afford to buy the expensive work of Stephens.

The dictionary of Scapula has frequently been reprinted. He himself published a second edition at Basel in 1589. Other reprints appeared in 1594, 1598, 1605, 1611, 1627, 1637. The Elzevirs of Amsterdam published, in 1652, a fine edition in folio, which was reprinted, in 1665, at Basel. The last editions are those of Glasgow, 1816, 2 vols. 4to., and of London, 1820, 4to., edited by Major. Another work of Scapula, 'Primogeniæ Voces, seu Radices Linguæ Latinæ,' was published at Paris, in 1612, 8vo.

SCARABÆIDES, a very extensive group of beetles forming the chief part of the section Lamellicornes. The Scarabæides of Latreille were regarded by Linnæus as a genus, but this great naturalist being acquainted with 87 species only, whilst the various collections at the present time contain together about 3000, it is natural that entomologists should have sought for characters among the species of this immense group, by which they might be divided into sections; hence we find in the works of Fabricius (Linnæus's pupil) the present group raised to the rank of a family, and subdivided into several genera. These genera are however but few in number compared with those instituted by modern entomologists, which amount to nearly 200.

The Scarabæides (or Scarabæidæ) are distinguished from the other section of Lamellicorn beetles (the *Lucanidæ*) chiefly by the structure of their antennæ, which are proportionately shorter; the basal joint being of moderate size, that is, but little longer than those which follow it;[*] whereas, in the *Lucanidæ*, the basal joint is usually very long, and often nearly as long as all the other joints taken together,[†] the latter forming, in their natural position, an angle with the first joint. The club with which the antennæ terminates also generally differs considerably in form. In the *Scarabæidæ* it is most usually composed of three leaf-like joints but sometimes the number is increased to seven, as in the common cockchafer (Melolontha vulgaris), and these joints, when the insect is at rest, are closely applied together, and form either an elongated or rounded nob, which is bent at an angle with the basal joints. In those species which have the club rounded, the two outer joints are stouter than the others, and have the external surface convex, and the internal convave. In the *Lucanidæ* the terminal joints are produced in front at an angle with the axis, but are less expanded, and generally more distinctly separated and shorter than in the *Scarabæidæ*. The more typical species of the *Lucanidæ* moreover are remarkable for the great development of the mandibles in the male sex.[‡]

Latreille divides the *Scarabæidæ* into six sections, to which he applies the following names:—*Coprophagi*, *Arenicoli*, *Xilophili*, *Phyllophagi*, *Anthobii*, and *Melitophili*.

The *Coprophagi* have the antennæ generally composed of eight or nine joints, the three last of which form the club; the labrum and the mandibles are membranous and hidden, and the lobe with which the maxillæ are terminated is also of the same texture; it is broad and curved inwards. The terminal joint of the maxillary palpi is always the largest, and either approaches to an oval form, or is nearly cylindrical: but the terminal joint of the labial palpi is almost always more slender than the preceding joints, and often very small. Behind the last-mentioned palpi is a small membranous protuberance. The mentum is emarginated, and the claws of the tarsi are always simple.

To this group belong the dung-feeding Scarabæi, and these are for the most part of a black colour, or black and brown. Some few species however are adorned with brilliant metallic colours. They are usually of a short and broad form; in some the body is somewhat depressed, and approaches to a square form; the head is large, broad, and flattish, and has numerous notches in front; the fore legs are very broad and deeply notched on the outer side, and are moreover remarkable for the want of tarsi to the anterior pair of legs, and the absence of a scutellum. To this section belongs the Sacred Beetle of the Egyptians. The *Scarabæus Sacer* of Linnæus is about one inch long, or rather more, and of a black colour. This species is not only found in Egypt, but is met with in the South of France, Spain, and Italy, and, as well as other species of the group to which it belongs, encloses its eggs in a ball of excrement, which it forms by rolling the substance by means of its hind legs. The size of the ball, when completed, is much larger than that of the insect, being sometimes as much as one inch and a half in diameter.

In other species of the *Coprophagi* the body is convex, and although short, slightly inclining to a cylindrical form. A great portion of these have the head armed with an erect horn in the male sex, and the fore part of the thorax truncated or slightly concave, elevated in the middle, and not unfrequently produced at the sides into short stout pointed horns, as in the genus *Copris*. In a closely allied genus (*Phanæus*) the species are usually adorned with brilliant colours. These insects have often a very long horn on the head, or this is sometimes replaced by two short horns; the thorax has a concavity in front, and usually has an angular protuberance on each side of the disk. These insects are usually of moderate size, and sometimes large, but there are two extensive groups of *Coprophagi* the species of which are small; they constitute the genera *Onthophagus* and *Aphodius*. In the former the body is short and subdepressed; the thorax is nearly as large as the elytra, and has a concavity in front, and a protuberance in the middle of the posterior boundary of this concavity; the head is usually armed with a small horn, which is directed backwards and upwards. In the *Aphodii* the body approaches to a cylindrical form, and the head and thorax are destitute of horns.

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[*] See Fig. 9 in Article COLEOPTERA, vol. vii., p. 341.

[†] See Fig. 13.—*Ib.*

[‡] The common Stag beetle (*Lucanus Cervus*) affords a familiar example of this family.

Of the genera mentioned, we possess no British examples of the first, or *Scarabæus* proper (or *Ateuchus*, according to some authors). The species of this group are confined to the warmer parts of the Old World. The species of the genus *Copris*, *Onthophagus* and *Amphodius*, are of universal distribution, if we except Australia, where we are not aware that the first of these genera occurs. The species of *Phanæus* are almost entirely confined to the warm parts of South America, the only exceptions occurring in North America.

The species of the second great section of the Scarabæidæ (the *Arenicoli*) are distinguished by their having the mandibles horny and usually projecting; the lobe of the maxillæ is straight; the terminal joint of the labial palpi is always distinct, and nearly as long as the preceding; the antennæ have ten or eleven joints; they are moreover distinguishable from other Scarabæi (the species of *Aphodius* excepted) by their elytra being extended over the apex of the abdomen. The three principal genera in this section are *Geotrupes*, *Bolboceras*, and *Trox*. The species of *Geotrupes* are usually of moderate size, of a black colour, often tinted with blue or green, and usually brilliant beneath. The body is convex, and the head and thorax are rarely furnished with protuberances; they are almost entirely confined to Europe, North Asia, and North America; feed upon the excrement of cattle, under which they construct their burrows. Several species are found in England, and some are seen in great abundance flying about the roads towards the evening.

In *Bolboceras* the body is nearly hemispherical; the males are often provided with an erect horn on the head, and protuberances on the fore part of the thorax. The species are usually of moderate size, and appear to be found in all the temperate and warm parts of the globe. Only one species is found in this country.

The species of the genus *Trox* are also usually of moderate size, and are found in all parts of the globe. In these insects the body is convex, and remarkable for the roughness of the upper parts: they are always of a dull brown or greyish colour, and appear as if covered with a coating of dried earth. Their food (according to Latreille) consists of the roots of vegetables, but they will also eat decayed animal substances, and in this respect differ from other *Scarabæi* the habits of which we are acquainted with.

Latreille's third and two following sections we cannot regard as very natural. [XILOPHILI.]

SCARBOROUGH is a borough and market town situate in the wapentake of Pickering Lythe, in the North Riding of the county of York, in 54° 18′ N. lat. and 11″ W. long., 40 miles north-east of York, and 217 north of London. It returns two members to parliament.

The peculiarities of the locality attracted to it inhabitants at a very early period: its name, implying a fortified rock, is of Saxon derivation, and there is reason to suppose that it was also a Roman settlement.

It is situated in the recess of a semicircular sweep of the coast, forming a bay open towards the south and south-west, and protected towards the north and north-east by the high and steep promontory with the old castle on its summit. It has, step by step and street by street, crept up the acclivity, the oldest streets having been formerly a part of the sands, and the modern streets and terraces being the most elevated, and commanding an extensive seaward prospect.

The first authentic record of its municipal character occurs in the reign of Henry II., who conferred a charter of incorporation upon the town, and granted to the bailiffs, burgesses, and inhabitants certain dues on merchant ships and fishing-vessels, to enable them 'to make a new port with timber and stone.' It ranks amongst the most antient boroughs that send members to parliament; and in the parliament held in 1282, the 11th of Edward I., Scarborough was the only town in Yorkshire, besides the city of York, that was summoned to send representatives. The town itself was in antient times defended by strong walls, a moat, and earthen mounds; and the castle must, before the application of artillery, have been absolutely impregnable to all attacks of open violence. The ruins of this antient castle are on a promontory elevated more than 300 feet above the level of the sea, having at the summit an area of nineteen good green acres, terminating on three sides in a perpendicular rock, and the fourth side, towards the town and bay, being a steep rocky slope. The castle was built in the reign of King Stephen, by William le Gros, earl of Albermarle and Holderness, and has been the scene of many events remarkable in history. Here Piers de Gaveston, the favourite of Edward II., sought refuge from the exasperated barons, but was obliged to surrender for want of supplies, and was beheaded. Robert Aske, the leader of the Pilgrims of Grace, made an unsuccessful attempt upon the castle in 1536. In the time of Wyatt's rebellion, in 1553, it was surprised and taken by Thomas, second son of Lord Stafford, by the stratagem of introducing a number of soldiers disguised as peasants; but three days afterwards it was retaken by the earl of Westmoreland, and Stafford and three other of the leaders were executed for treason. During the civil wars the castle underwent two sieges by the parliamentary forces, the first of which lasted twelve months. It was then, like many others, dismantled by order of the parliament. On the breaking out of the rebellion in 1745, it underwent a temporary repair; and when the danger was over, the present barracks, to accommodate 120 soldiers, were built and three batteries, for the protection of the town and harbour, have since been erected.

The style of the corporate body is, 'the bailiffs and burgesses of the town of Scarborough.' The borough is comprehended in the Act for the regulation of Municipal Corporations in England and Wales. Scarborough combines the advantages of sea-bathing and of mineral baths, and owes to these natural advantages its past celebrity and present prosperous condition. Its neighbourhood presents a course of the finest sands in England, undulating into a variety of beautiful bays, and sheltered by lofty cliffs and bold projecting headlands. Its own bay is spacious and open to the sea, and the water pure and transparent. The sand is clear, smooth, and level, and the inclination of the beach towards the sea scarcely perceptible. No considerable river enters this part of the sea, nor is the beach so extensive as to be very hot even under a summer's sun. The sea in the month of August is some degrees cooler than at Brighton or any place south of the Thames, and bathing may be enjoyed at all times of the tide, and in almost all sorts of weather, with security and ease. There are also various excellent baths, and the most complete accommodation for the enjoyment of marine bathing.

The two mineral springs on the very edge of the sea-water are protected from its encroachment by a handsome turreted structure called the New Spa, erected beneath the cliff, on an artificial foundation or sea-wall. This handsome building comprises a large saloon to assemble and walk in, and other smaller rooms and contrivances. Both the springs have been recently (in 1840) very minutely analysed by Professor Philipps of York, and are found to comprise carbonate and sulphate of lime, magnesia, and oxide of iron, in proportions which may be found accurately stated in Dr. Granville's 'Spas of England:' their effects are of a cooling and tranquillising character, and are of appropriate efficacy for patients labouring under acidity and pain in the stomach.

The scenery surrounding Scarborough is of a beautiful and indeed romantic character, and numerous objects of historic or architectural attraction are to be found within a moderate distance. Towards the north, elevated moors of great extent raise their bleak and barren summits, forming a bold and striking contrast in the landscape to the highly cultivated country that lies to the westward; and to the south and south-west the Wold Hills in the East Riding present another grand and extensive line of boundary to the prospect. Weaponness, or Oliver's Mount, little more than a mile from the town, possesses every requisite that can render a walk to its summit delightful. Within four miles is the picturesque village and parish of Harkness, where also is the elegant mansion of Sir R. V. B. Jonstone. The admirer of modern architecture may visit Castle Howard, the far-famed and splendid seat of the earl of Carlisle, while the lover of antient remains may contemplate the ruins of Rivaulx Abbey, supposed to have been the first Cistercian monastery founded in Yorkshire, which are of considerable extent and unusually perfect.

One of the most remarkable objects at Scarborough is the Cliff Bridge, erected upon piers seventy-five feet high, over a chasm 400 feet wide, which separates the town from the Spa, between which places the bridge now forms a delightful promenade. On the northern side of the bridge is an elegant circular edifice with a dome, for the museum of the Philosophical Society, which comprises a most complete and valuable series of geological specimens: part of the same building is also used as a news-room. There are two churches, the parish church of St. Mary's, and one more recently erected, called Christ Church; and also chapels in connection with various religious denominations—Independents, Baptists, Friends, Roman Catholics, Wesleyan and Primitive Methodists, and possibly some others.

Among the charities of the place may be mentioned the Amicable Society, for clothing and educating the children of poor persons in this town; the Seamen's Hospital, and a Sea-Bathing Infirmary. There are also several charities.

The population was 6409 in 1801, 6710 in 1811, 8188 in 1821, and 8369 in 1831.

SCARBROITE, *Hydrated Silicate of Alumina*, occurs massive. Fracture conchoidal. Hardness about 2·0. Easily scratched by the knife, and polished by the nail. Adheres to the tongue, and has a strong earthy smell when breathed upon. Colour white. Opaque. Dull. Streak shining. When put into water, does not become transparent, nor fall to pieces, but increases in weight. Specific gravity 1·48. Occurs as veins in the beds of sandstone covering the calcareous rock near Scarborough, between septæ of oxide of iron.

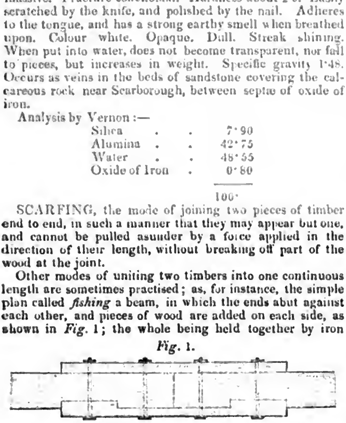
Analysis by Vernon:—

Silica	7·90
Alumina	42·75
Water	48·55
Oxide of Iron	0·80
	100·

SCARFING, the mode of joining two pieces of timber end to end, in such a manner that they may appear but one, and cannot be pulled asunder by a force applied in the direction of their length, without breaking off part of the wood at the joint.

Other modes of uniting two timbers into one continuous length are sometimes practised; as, for instance, the simple plan called *fishing* a beam, in which the ends abut against each other, and pieces of wood are added on each side, as shown in *Fig.* 1; the whole being held together by iron bolts. The strain on the bolts may be reduced by indenting the pieces added at the joint into the beam, as represented in the lower part of the figure; or by transverse keys of hard wood driven into grooves, of which one-half is cut in the beam, and the other in the supplementary pieces, in a similar manner to those shown in *Fig.* 6.

Fig. 1.



Where neatness is more essential than strength, scarfed joints are preferred to any arrangement of this kind, because a beam united by them is of the same breadth and depth at the joints as at other parts. *Figs.* 2 and 3 represent two of the simplest forms of scarfing, in both of which the strain is borne wholly by the bolts. It is advisable to add a plate of iron on the faces of the beam where the heads and nuts of the bolts pass through, and the ends of these plates may be turned into the wood, as shown in the cuts. Of these two plans the first appears rather preferable, because the screwing up of the bolts has no tendency to alter the position of the parts; while in the second it has a tendency to make the inclined faces slide upon each other, and thereby to open the joint.

Fig. 2.

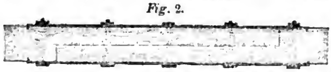
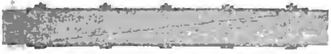
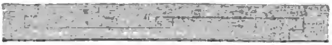


Fig. 3.



It is desirable to avoid depending solely upon bolts for the strength of a scarf, owing to the effect of the shrinking of the timber, and the liability of the bolts to be, in consequence of their small dimensions, pressed into the wood. *Fig.* 4 is a scarf that may be used without bolts, although the addition of them adds much to the security of the joint.

Fig. 4.



In this plan a key or wedge is driven gently into the square space at *a*, to bring the parts into their places. Two other illustrations will suffice to explain other varieties of scarfing. *Fig.* 5 is a diagonal scarf, in which the parts are said to be *tabled* together; they being so cut and fitted to each other that no force can separate them longitudinally, without breaking, so long as the bolts hold them together sideways.

Fig. 5.

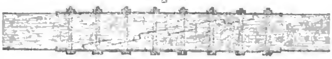
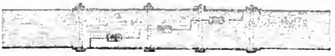


Fig 6 shows a very simple and good plan of scarfing, which is easily executed with accuracy, owing to the absence of oblique faces. In this arrangement keys are used to resist any force tending to separate the beam in the direction of its fibres, instead of the parts being tabled together. The ends of the keys, which should be of hard wood, and let into both pieces of the beam to an equal depth, are shown by the dark tint in the cut.

Fig. 6.



Varieties may be almost infinitely multiplied by increasing the number of the faces, whether oblique or square, and uniting the parts either by tabling, keying, or a combination of the two; but in most cases the greatest simplicity should be aimed at, in order that the parts may the more readily be made to fit each other with accuracy. Very complicated scarfs have been used by some old carpenters, respecting which Robison observes that 'many seem to aim at making the beam stronger than if it were of one piece;' an absurdity too manifest to need refutation. Where a scarfed beam is exposed to transverse strains, the joint should be varied from the ordinary form; but for these and some other contrivances to meet peculiar circumstances the reader is referred to the practical works of Tredgold, Nicholson, &c. When a piece of timber subject to compression in the direction of its length has to be scarfed, oblique faces should be avoided, because of their tendency to slide upon each other. Though bolts are commonly used to secure scarfed joints, iron hoops or straps, driven on tightly, have been recommended in their stead, and possess the advantage of not weakening the timber. In joints that depend wholly on bolts, Tredgold recommends that the sum of their areas should never be less than two-tenths of the area of the section of the beam. From the same authority we give the following rules for the length of scarfs:—

In oak, ash, or elm, the whole length of the scarf should be six times the depth or thickness of the beam, where there are no bolts.

In fir, without bolts, twelve times the depth.

The whole length of a scarf dependent wholly upon bolts should be in oak, ash, or elm, about three, and in fir, six times the depth of the beam.

When bolts and indents are used together, the length of the scarf may be, in hard woods twice, and in soft woods four times the depth.

SCARIFIER. [ARABLE LAND]

SCARITIDÆ, a family of Coleopterous insects belonging to the section Geodephaga, which section corresponds to the genera *Carabus* and *Cicindela* of Linnæus. The *Scaritidæ* have the prothorax separated from the elytra by a narrow cylindrical neck; the mandibles are usually large and armed with strong teeth on the inner side; the labrum is small; the mentum is furnished with a tooth; the antennæ are usually short, and have the basal joint long; the legs are short; the anterior tibiæ are broad, and strongly notched on the outer side, and fitted for burrowing; and the anterior tarsi in the males are not dilated. The body is usually elongated, and straight at the sides; the head, thorax, and elytra are nearly equal in width. The principal genera contained in this family are *Scarites*, *Pasimachus*, *Camptodontus*, *Acanthoceles*, *Clivina*, and *Dischirius*.

In *Scarites* (Fabricius) the mandibles are strongly toothed on the inner side, the second and third joints of the antennæ are obconic, and the following joints are shorter, compressed, and subquadrate. The species of this genus are very numerous, and are found in nearly all the temperate and warmer portions of the globe.

The species of the genus *Pasimachus* differ chiefly from *Scarites* in being proportionately broader, and of a somewhat depressed form; in having the thorax produced on each side behind, and forming distinct angles; the mandibles are shorter and more arched, and the maxillæ have no terminal acute hook. The species of this genus are peculiar to North America, and are of a tolerably large size, averaging about one inch in length.

Dejean separates from *Scarites*, under the generic name *Oxygnathus*, the *S. elongatus* of Wiedemann, which differs in having the mandibles more slender and elongated, and destitute of teeth on the inner side. The only known species is found in the East Indies; it is of a very narrow form.

Camptodontus is another genus founded by Dejean upon a single species. In this insect the labial palpi are decidedly shorter than the external maxillary palpi; and, like them, are terminated by a spindle-formed joint: the basal joint of the antennæ is scarcely longer than either of the following joints. It inhabits Cayenne.

The genus *Acanthoceles* is established by Latreille upon a singular insect found at the Cape of Good Hope; it is of a short and broad form, and has the anterior tibiæ still more strongly notched than in the species of *Scarites;* the tibiæ of the middle and hinder pair of legs are stout, curved, and concave on the inner side, and very rough and covered with short spines on the outer side. The thorax is broader than long, and the elytra are almost equal in length and width, distinctly striated, and rounded at the apex. This insect is of a black colour (as are almost all the *Scaritidæ*), and about three-quarters of an inch in length.

The species of *Clivina* are of small size, averaging about a quarter of an inch in length, and nearly cylindrical form. The basal joint of the antennæ in these insects is scarcely longer than the others, the mandibles are comparatively short, and the terminal joint of the palpi is pointed. They are found nearly all over the world; they live under stones, and frequent damp situations.

In the genus *Dischirius* the species also have a wide geographical range, and are of small size; indeed the smallest of the present family: they are very nearly allied to *Clivina*, but are almost invariably adorned with metallic colours, usually brassy-green. The terminal joint of the labial palpi is proportionately stouter than in *Clivina;* the thorax usually approaches to a spherical form, and the tibiæ are less strongly notched. Numerous species of this genus are found in England, the largest of which is less than a quarter of an inch in length. They are always found on the wet mud on the margins of ponds and such places.

SCARLATI'NA (originally written Scarlattina, from *scarlatta*, a red-coloured cloth), scarlet fever. This disease was not distinguished by the antients from any of the other eruptive fevers; they contented themselves with classing together all these fevers as pestilential, and they attributed the variety of eruptions that accompanied them to different combinations of the humours. Small-pox, measles, and scarlatina were described by the Arabians, but they looked upon them merely as varieties of the same disease, and even to the close of the eighteenth century the two last-named maladies were confounded. Dr. Withering, in a second edition of an essay which he published on scarlet fever in the year 1793, first pointed out its distinctive characters.

Scarlatina, like small-pox and measles, may appear as an epidemic, or it may be propagated by a specific contagion; as an epidemic, it most usually appears at the latter end of the summer and the beginning of autumn; sporadically, it is met with at all seasons; it further resembles the diseases we have just named in rarely attacking twice the same individual. Scarlatina varies much in severity, from the mild febrile disturbance which has been pronounced by Sydenham to be fatal only through the officiousness of the doctor, to that grave form of the disease which has received the appellation of malignant. This difference has given rise to its division into three species, the Scarlatina simplex, S. anginosa, and S. maligna. Scarlatina is ushered in by rigors, followed by increased heat of the body, thirst, loss of appetite, and all the symptoms of inflammatory fever. On the second day of this fever, or somewhat later in the severer forms of the disease, patches of a scarlet-coloured efflorescence begin to appear on the face and neck, which extend downwards, and, coalescing, soon spread over the whole body. On the trunk however the rash is seldom uniform, but is distributed in diffuse irregular patches, the scarlet hue being most vivid about the flexures of the joints and on the loins; occasionally minute vesicles are visible, and Sauvages has considered this circumstance sufficient to constitute a distinct species, which he calls S. variolodes. On the third and fourth days the eruption is at its height; even the mouth and fauces are not free from it, the papillæ of the tongue are unusually red and elongated, and the face is generally more or less swollen. On the fifth day it begins to decline, disappearing by interstices, so that the patches reappear as at the commencement, and it is generally gone before the end of the seventh. Between the eighth and twelfth days the cuticle comes off in the form of a scurfy desquamation, and the fever has subsided. At those periods of the disease when the eruption is in patches, scarlatina is apt to be mistaken for measles, but it may readily be distinguished from the last-named disease by the following signs:—In measles the patches are of a rosy hue, of a crescentic form, and elevated above the surrounding skin; in scarlatina they resemble more the colour of boiled lobster, want the crescentic shape, and the hand passed over them detects minute asperities, but no elevated patches. It is further distinguished from measles by the greater heat of skin, the temperature being sometimes as high as 108° or 112° of Fahr., by the absence of catarrhal symptoms, and by the state of the papillæ of the tongue.

Roseola is the name of an affection which is characterised by an eruption bearing some resemblance to scarlatina; but it is of a more crimson colour, pursues its course in a direction contrary to that of scarlatina, viz. from the extremities and trunk to the neck and face, and is attended with less constitutional disturbance.

Scarlatina accompanied with sore throat, anginosa, or cynanchica, as it is termed, is a much more frequent and severe form of the disease than that which we have just described. Not only are the precursory febrile symptoms more violent, but the whole course of the malady is protracted; the eruption is seldom so universal as in the simple variety, but is in scattered patches which frequently vanish and reappear, the interior of the mouth and fauces is of a high red colour, tumefied and painful, superficial ulcerations not unfrequently form on the tonsils, uvula, and soft palate, and the throat is much clogged up with a tough viscid phlegm. In S. maligna the fever is of a typhoid character, the pulse is small and feeble, the tongue and lips dry, and encrusted with a brown fur; there is delirium alternating with coma, and the rash is faint and continually coming and going; the ulcers in the throat are covered with dark-coloured sloughs, and a large quantity of viscid mucus clogs up the fauces and impedes respiration and deglutition. These symptoms are often accompanied by diarrhœa, and by petechiæ on the skin, with hæmorrhage from the nose, throat, bowels, or other parts, which generally lead to a fatal termination: this may occur on the third or fourth day of the disease, or the patient may linger to the second or third week: if recovery take place, it is exceedingly tedious. It has been observed that during the prevalence of scarlatina adults are not unfrequently affected with the efflorescence in the mouth and throat, without the skin participating in the affection. For this class of cases Dr. Tweedy has proposed the name of S. faucium. All the varieties of scarlatina that we have mentioned may be observed during the prevalence of the same epidemic, and even among members of the same family; but it is no less true that each epidemic has generally a certain character or type, which it is important to ascertain in order to regulate the treatment. This circumstance renders it difficult to come to any just conclusion as to the mortality from this disease.

From the register of cases kept at the London Fever Hospital, it appears that in the years 1822 and 1823 the disease was extremely mild, as none of the patients died during these years. In 1824 the mortality was 1 in 21; in 1825, 1 in 13; in 1826, 1 in 29; in 1827, 1 in 41; in 1828, 1 in 10; in 1829, 1 in 6; in 1830, 1 in 6; in 1831 the disease was not prevalent, and none of the cases proved fatal; in 1832 the mortality was 1 in 40. Of 644 cases treated at this hospital, the gross mortality was 38, of which 13 were males and 25 females. Tables kept at the same institution show that females are more subject to its attacks than males, and children than adults; but it is not a disease which prevails so generally as measles or small-pox. If not equally prevalent however, the secondary diseases induced by it are perhaps more troublesome and numerous, and among the principal of these may be enumerated anasarca, ophthalmia, inflammation of and discharge from the internal ear, with destruction of its drum, and consequent deafness, enlargement and suppuration of the cervical glands, laryngitis, and chronic bronchitis. The first-named of these diseases, Anasarca, is of such frequent occurrence, that a few remarks on it are necessary to render complete our history of Scarlatina. It comes on as frequently after the mild as after the severe forms, but is never observed as a sequence of S. maligna, and rarely occurs after puberty. Two or three weeks after desquamation of the cuticle has taken place, and while the patient is convalescing, he begins to complain of languor and loss of strength and appetite; his sleep is disturbed, his pulse quick, his bowels costive, and his urine scanty. Or the attack may begin with sickness and purging, the face and upper parts then begin to swell, and the swelling shortly extends over the whole body. In some rare instances, after the anasarca has become general, effusion has taken place into the brain, chest, and abdomen, occasioning death in a few hours. The morbid appearances which are met with in the bodies of those who die of Scarlatina, depend upon the stage of the disease at which dissolution took place. At an early period, it may be said that we are unacquainted with any changes in the solid or fluid constituents of our frame that are characteristic of the disease we are treating of, whilst those that are met with when death has taken place at a more advanced period can hardly be said to be proper to the disease, but are owing to certain morbid actions supervening upon it and excited by it. With respect to the treatment of Scarlatina, it must have reference to the constitution of the individual attacked, to the type of the prevailing fever, and to the particular form of it by which he may be effected. In the simple variety, little is required beyond keeping the patient quiet and cool, and restricting him to the use of a mild unstimulating diet. In the S. anginosa, the treatment as a general rule should be antiphlogistic, general bleeding is not requisite, and is apt to retard recovery by reducing the patient's strength; but cupping on the back of the neck, or the application of leeches behind the ears or under the jaw, is considered by Dr. Tweedy to be 'the most effectual mode of relieving the inflammation of the throat.' Emetics are likewise recommended at the commencement of the disorder, and the bowels are to be kept open by means of gentle aperients. Many practitioners advise the employment of antimonials and other diaphoretics, in order to excite perspiration, but these remedies fail in producing what their advocates so much desire, and consequently no useful purpose can be served by their exhibition. The practice which seems on the whole to be most beneficial, and certainly is most agreeable to the patient's feelings, consists in reducing the unnatural heat of the skin by the application of external cold. Dr. Currie of Liverpool, who first called the attention of the profession to this point, directs that the patient be taken out of bed, 'stripped naked, and placed in an empty tub; a bucket or two of cold water is then to be suddenly emptied over the head, and the body being quickly dried, he is to be again placed in bed. If the sensation of chilliness remain, a little warm wine and water is to be administered.' The more usual mode is to wash or spunge the surface of the body with cold water, or vinegar and water, as often as the temperature is above the natural standard. It is of course necessary that the apartment be kept cool and well ventilated, and the thirst may be allayed by acidulated drinks. When the throat is much affected, a small blister may be applied externally, and warm-water gargles made use of; or the steam arising from warm water may be inhaled with advantage. After the fever and rash have abated, bark and the mineral acids, with a more generous diet, should be prescribed.

S. maligna, if seen at its commencement, is generally benefited by an emetic; but in a more advanced stage it requires the same mode of treatment which is adopted in all malignant fevers. While the excretions are promoted by some mild mercurial preparation, as the Hydrargyrum cum cretâ, in doses of three to five grains once or twice a day, local inflammation must be guarded against and combated by means of leeches and blisters, and at the same time the strength must be supported by a suitable diet. Cases in which the vital powers are extremely low require the free administration of wine and the occasional use of opium. The sesqui-carbonate of ammonia has been much recommended by Dr. Peart, who directs that two drams of it be dissolved in five ounces of water, and that two tea-spoonfuls of this mixture be given every two, three, or four hours, according to the urgency of the symptoms. When the cutaneous heat is great and the surface dry, tepid washings afford great relief; and where the patient is unable to gargle his throat, the sloughs and mucus should be removed by means of the syringe. Similar treatment, both local and general, will be required in that variety of the disease in which the throat is affected without any efflorescence on the skin, regard of course being had to the degree of its virulence. In the treatment of all these varieties of Scarlatina practitioners may differ in opinion respecting the efficacy of particular remedies, but they are all agreed upon the general principles to be adopted, and of these none is more important than the ventilation of the sick chamber and the free admission of fresh air around the patient.

SCARLATTI, ALESSANDRO and DOMENICO, father and son, are persons of great celebrity in musical history, who flourished from the latter part of the seventeenth century till the middle of the eighteenth.

Alessandro, founder of the Neapolitan school of music, was born at Naples in 1650, and though it is not known from whom he derived his early instruction, it is certain that he completed his studies under Carissimi, to whose notice he introduced himself, and whose favor he obtained by his performance on the harp, which was of the most finished kind. This acquaintance was formed at Rome, in which city, and also at Venice, Alessandro produced many compositions, both for the church and theatre, with uniform success. After passing some years in various parts of Italy, he finally settled in his native city, and devoted himself to his art, the improvement of which was his most anxious wish, and engaged a large share of his time. He at first turned his attention to the operatic overture, and soon gave a dramatic character to what till then had been without design and wretchedly meagre. He also is supposed to have originated violin accompaniments to airs, and likewise those symphonies, or ritornels, which afford variety and relieve the singer. The recitative *obbligato* is also indebted to him for vast improvement; and the *da capo*, or repetition of the first portion of an air, is ascribed to him, and continued long in use; though modern taste has abolished what, very frequently in vocal music, led to a gross violation of common sense.

The elder Scarlatti, we are told, produced two hundred masses, a hundred operas, and three thousand cantatas. He was, Dr. Burney says, author of the words of many of the last. The same writer adds, that he 'found part of his (Scarlatti's) property among the stolen goods of all the best compositions of the first forty or fifty years of the last century.' Very little of this amazing quantity was ever printed, and a still smaller portion is known, even to musical antiquaries, at the present day. Some of the cantatas were arranged as duets by Durante, his pupil. [Durante.] A clever madrigal for four sopranos and an alto is published in the second part of Martini's *Saggio di Contrappunto;* and a fugue of his composition, in F minor, which, for scientific contrivance and beauty of effect, has few rivals, appears among the Harpsichord Lessons of his son. He was knighted at Rome by Christina, queen of Sweden, and there died in 1725.

Domenico Scarlatti was born in 1683. He inherited the prudence as well as the talent of his father; and as the parent had profited much by his connection with so great a master as Carissimi, so the son derived at least equal advantages from his acquaintance with the first of musicians, Handel, whose friendship he acquired while both were residing at Venice. So much attached was the young Italian to the celebrated Saxon, that he followed him to Rome, and only quitted his friend on receiving an appointment in the service of the king of Portugal. He afterwards returned to the papal city; but on the death of his father, proceeded to Naples, where he formed an intimacy, beneficial to both, with Hasse, an opera composer of the first rank. [Hasse.] He finally, in 1735, accepted an invitation to Madrid, as master of the royal chapel and teacher to the queen, who had been his pupil at Lisbon. He died in that city in 1751.

Domenico left many operas and other compositions; but his 42 *Suites de Pièces pour le Clavecin* is the work by which he is now known, and on which his reputation solely rests. To execute these was, during nearly half a century, the object at which all ambitious harpsichord players aimed: to perform them well was considered a decisive proof of practical excellence; and even now it requires a nimble and brilliant finger to do them justice, though in point of style they are thoroughly obsolete, are quite unsuited to the nature of the piano-forte, and, indeed, are considered rather as musical curiosities than as fit subjects for study, even for the professional musician. We must however except the two fugues forming part of the work, which, for every good quality that distinguishes the kind of composition, have never yet been surpassed, and must always be admired by those who have acquired a taste for this elaborate species of harmony. Domenico Scarlatti left a son, Giuseppe, born at Naples in 1718, who composed some harpsichord music, and many Italian operas, all of which were popular in their day; and some of the latter were produced at the King's Theatre in London; but not a single piece of his music ever came under our view. Dr. Burney (in Rees's *Cyclop.*) says, —'his works are distinguished by a light pleasing style peculiar to the Scarlatti family.' He died at Vienna in 1776.

SCARLET DYE. The finest scarlet dye is obtained from cochineal. [Cochineal.] According to Berthollet the dyeing of scarlet is performed at two operations; the first is called the boiling (*bouillon*), and the second the *reddening*.

For a boiling intended to dye about 100 pounds of cloth, six pounds of bitartrate of potash (cream of tartar) are first thrown into water a little more than lukewarm; after the bath has been well stirred, and become a little hotter, half a pound of powdered cochineal is thrown in and well mixed. Immediately afterwards five pounds of clear solution of chloride (muriate) of tin are poured in and carefully mixed. As soon as the bath begins to boil, the cloth is introduced, and made to circulate rapidly two or three times; when it has been subjected to a boiling heat for two hours, it is removed and well washed.

For preparing the second bath, which is the *reddening*, five pounds and a half of powdered cochineal are put into a boiler, as soon as the water which it contains is about to boil, and after being properly mixed, fourteen pounds of solution of chloride of tin are added, and the cloth is thrown in, rapidly whirled for a short time, then boiled for an hour, taken out, cooled, and washed and dried.

Some variations in the proportions of the different ingredients are occasionally adopted, for an account of which we may refer to Berthollet's 'Treatise on Dyeing.'

SCARPA, ANTONIO, was born at La Motta, a small village of Friuli, in the year 1748. His parents were persons in humble life, and he was indebted to a distant relation for the means of commencing his studies, while yet very young, at the university of Padua. The death of his early benefactor soon left him dependent on his own resources; but he continued to pursue his studies with such diligence that he became distinguished above his fellows, and was honoured with the esteem and friendship of the illustrious Morgagni.

In the year 1772 Scarpa's acquirements had become so well known, that he was selected as the most fit person to fill the chair of anatomy in the university of Modena, which was then re-established. Here he published his first work, a treatise on the structure of the internal ear. The grand-duke of Modena, Francis III., to whom this book had been dedicated, nominated Scarpa in the same year to the post of surgeon-in-chief to the military hospital in his capital. Success abated nothing of Scarpa's habits of diligence. Having published another work, on the structure of the nerves, he set out on a journey to France, Holland, and England, during which he made the acquaintance of many eminent men. During his stay in Paris, the offer of the anatomical chair in the university of Pavia was made to him by the emperor Joseph II. A feeling of gratitude to his early patron induced Scarpa to decline this flattering offer until he was urged to accept it by the duke of Modena himself. He was eventually installed in his chair at Pavia in the year 1783. His researches into the anatomy of the organs of smell and hearing, and his treatises on the nerves of the heart, and on the minute anatomy of bone, followed each other in rapid succession, and showed his unwearied assiduity. These works, and especial that on the nerves of the heart, which decided in the affirmative the long disputed question whether the heart is supplied with nerves, had procured for Scarpa before the end of the eighteenth century a European reputation. But he still continued those labours to which he was so much devoted. In the year 1801 he published a valuable treatise on the diseases of the eye; and in 1804 his observations on the cure of aneurism appeared, to which a question proposed some years previously by the Parisian Academy of Medicine had given occasion. In 1809 he published a splendid work on hernia, which raised his reputation to the highest point. Three years afterwards he gave up the labour of public teaching, but received in the year 1814 the honourable appointment of Director of the Medical Faculty of Pavia. His suggestions for an improved system of medical education were not attended to, and disgust led him to resign this post, and about the same time he retired from practice. He followed his old pursuits however with undiminished energy in retirement, and it is to this period of his life that we owe some most valuable remarks on the operation for stone, as well as many other surgical tracts. The collection of these minor treatises was one of the last labours of his life. He pursued it, though suffering for some years under almost total blindness, and the publication of the third and concluding volume, in 1832, preceded his death by only a few months.

In addition to his profound knowledge as an anatomist, Scarpa possessed unrivalled skill as a draughtsman, a talent that contributed greatly to the success of his works. His industry was indefatigable, and a bare enumeration of the titles of his works would occupy nearly a column of this Cyclopædia. All that he wrote had a definite practical aim, and hence no lapse of time will render his labours useless or cause his name to be forgotten. In point of industry he has been compared to Cuvier, and, like him, he did not confine his investigations to one department of science. Even medicine and the kindred sciences did not engross all of Scarpa's time. He was an elegant scholar, a man of great taste in the fine arts, as well as thoroughly skilled in agriculture, and a passionate lover of the chase. He was a member of the Institute of France, and of most of the learned societies of Europe; and he was honoured even by Napoleon, who seems to have respected his devoted loyalty to the Austrian family, as well as by the house of Austria itself.

In person Scarpa was about the middle size, of very gentlemanly deportment, though not without a degree of reserve and austerity towards strangers, but of a disposition so amiable that he made friends of all who knew him. After several years of severe suffering from a calculous disorder, which terminated fatally, by inducing inflammation of the bladder, Scarpa died at Pavia, on the 30th of October, 1832.

A list of Scarpa's works, many of which have been translated into English, is appended to a sketch of his life in the 'Archives Générales de Médecine' for March, 1833. Another biographical notice is contained in the 'Medical Gazette' for December 8, 1832, where the date of his birth is erroneously stated to have been 1745; and a third, more full than either, in the 'Annali Universali di Medicina' for November, 1832.

SCARPE. [Schelde.]

SCARPANTO, the modern name of the island Carpathus (Κάρπαθος), which lies between Rhodes and Crete, from the latter of which it is distant 60 Roman miles, according to Pliny (iv. 20). We know scarcely anything of its history. It is mentioned by Homer (*Il.*, ii. 676), under the name of Crapathus (Κράπαθος), and is spoken of by Pliny (v. 36) as one of the Rhodian islands. Strabo (x. 489, Casaub.) describes it as lofty and 200 stadia in circumference, and says that it contained four towns, one of which was called Nisyrus. The sea between Rhodes and Crete was called the Carpathian Sea, from the name of the island.

SCARRON, PAUL, a celebrated French burlesque writer, was born at Paris in or about 1610, of an antient family, and to the inheritance of wealth, until an artful stepmother supplanted him in his father's affections, and finally deprived him of his inheritance and reduced him to poverty. Exiled from home, young Scarron purchased his restoration to favour by entering upon an ecclesiastical life, for which his character and habits were ill suited, and in which he never proceeded beyond the introductory degrees. For some years he indulged in gross and scandalous debauchery, in which, at the age of 27, he was stopped by the results of a singular extravagance. Being at Mans, where he held a canonry, during the Carnival, and desirous of sharing the gaieties of the season, which he could not do consistently with his character as a churchman, he and three friends hit on the device of covering themselves with honey, and rolling in feathers. Thus plumed they entered the town; but the joke was thought too strong even for Carnival licence, and being assaulted and plucked, the unfeathered bipeds were fain to escape by jumping into the Sarthe, and hiding in the rushes. The other three died in consequence of this adventure; and Scarron himself contracted maladies from cold and exposure, which rendered him for the rest of his life, to use his own phrase, an abridgment (*raccourci*) of human suffering. Disease and pain could not however subdue his lively spirit, and the rest of his life was spent in ministering by his writings and conversation to the amusement of the courtly and the gay, to whom his house became a rendezvous; and not being troubled with an over-scrupulous delicacy, he obtained both from private liberality and court favour the means of leading an easy and expensive life. In 1652 he became acquainted with Madlle. d'Aubigné (afterwards Madame de Maintenon), then in a state of poverty and dependence. His heart, capable, notwithstanding its levity, of noble emotions, was touched by her merit and her distress; and with a delicate and disinterested generosity, he offered to her the choice either of entering a convent at his expense, or of sharing his precarious fortunes as his wife. She chose the latter; and chastened by her influence, the society of his house, always a favourite resort of the wits, became still more select and brilliant. Meanwhile his fortune became smaller and smaller; for on his marriage he had lost his canonry, and his other chief dependence, the profit arising from the sale of his works, diminished greatly towards the end of his life. This however, like all other evils, he bore with unflinching gaiety; and his last days were only troubled by anxiety for the prospects of his wife, whose conduct in a trying situation had been irreproachable, and for whom he had conceived a high affection and esteem. [MAINTENON.] He died October 14th, 1660; and his last words were, 'I could not have supposed it so easy to make a joke of death.'

One cannot but sympathise with a man who bore great sufferings with such unconquerable cheerfulness; and that there was much to love in Scarron's libertine and thoughtless character is proved by the affection of a large circle of friends, including many of the most distinguished characters of the time. His works bear the impress of his mind: witty, lively, unlaboured, and unrefined, they were despised by the critic Boileau, but favourites on the stage and with the people. The plots of his comedies were mostly borrowed from the Spanish: they are slight, irregular, and farcical; but they made people laugh. His collected works have been published in various editions. The chief of them are, 'L'Eneide Travestie,' 8 books, continued by Moreau de Brazey; Comedies; 'Le Roman Comique,' the most lasting of his works; 'Nouvelles Espagnoles,' translated from the Spanish; and his Letters. Most of Scarron's works have been translated into English; some by the facetious (to give him the usual epithet) Tom Brown, and the 'Roman Comique' by Oliver Goldsmith.

SCARUS, a genus of fishes of the family Labridæ. The species of this genus are remarkable for the structure of their jaws, which project, are convex in front and concave within, and present a sharp cutting edge. The teeth cover these jaws, being arranged upon their outer surface like scales, and are blended together in such a manner that their outlines are scarcely discernible. Besides these teeth on the jaws, there are others on the pharyngeal plates, which are of a depressed transverse form. The body is of the same oblong oval form as in the Wrasses, to which fishes the species of the present group are closely allied. The scales are very large.

The Scari are inhabitants of the tropical seas, and from the brilliancy of their colouring, combined with the peculiar form of their jaws, have received the name of parrot-fishes.

SCAURUS is the cognomen of a branch of the Patrician gens of the Aemilii, but it was also borne by other families, such as the Aurelii. The house of the Aemilii Scauri did not attain high honours until the latter period of the republic, and there are only two members of it who have acquired reputation in the history of Rome, M. Aemilius Scaurus, the princeps senatus, who was consul in 115 B.C., and his son, who bore the same name. The first of the family mentioned in history is L. Aemilius Scaurus, who had the command of a part of the fleet in the war against Antiochus, 190 B.C. (Liv., xxxvii. 31.)

M. AEMILIUS SCAURUS, the princeps senatus, was born in 163 B.C. His father, though a patrician, was poor, and carried on the business of a charcoal merchant (*carbonarium negotium*), (Aurel. Vict., *De Vir. Ill.*, c. 72), and when he died, the son, for want of means, hesitated whether he should devote himself to public affairs or engage in some lucrative business. He decided upon the former. He first distinguished himself as a soldier in Spain, and afterwards (126 B.C.) he served under L. Aurelius Orestes in Sardinia. A few years afterwards (123 B.C.), when he obtained the office of curule ædile, he was not able to exhibit to the people the games customary on that occasion, but he made up this deficiency by a just and punctual fulfilment of the duties of his office. In the year 120 B.C. he was prætor urbanus, and his coins, on which the head of Apollo is represented, probably belong to this year, and refer to the *Ludi Apollinares*, the celebration of which was always conducted by the prætor urbanus. At the time when Hiempsal sought help at Rome against Jugurtha, Scaurus was among the first who urged the necessity of punishing the usurper, and did not, like many others, accept the bribes that were offered to him. This conduct however is attributed by Sallust (*Jug.*, 15) not to his love of justice, but to his fear of detection; and this opinion is sufficiently confirmed by his subsequent conduct in Africa (Sallust, *Jug.*, 29) and on other occasions. In the year 116 B.C. he offered himself as a candidate for the consulship, but without success. (Cic., *Pro Muren.*, 17.) In the following year however he not only obtained the consulship, but in the course of the same year he was made princeps senatus. During his consulship he carried two laws, one a Lex Sumtuaria, and another respecting the suffrage of freedmen; and he also triumphed over the Ligurians and several Alpine tribes.

In 109 B.C. Scaurus was censor with Livius Drusus, and in this capacity he restored the Mulvian bridge, and formed the Via Aemilia, which ran past Pisa and Luna to Dertona. When his colleague died, Scaurus, according to custom, should have laid down his office, but he refused until the tribunes threatened him with imprisonment. In 107 B.C. Scaurus was made consul a second time. His unsuccessful competitor, P. Rutilius, brought a charge of bribery and corruption (*ambitus*) against him; but he was acquitted, and then brought the same charge against his adversary. (Cic., *Brut.*, 30; *De Orat.*, ii. 69.) Some years afterwards one of his sons took part in the unfortunate campaign against the Cimbri on the Athesis (Adige), under Quintus Catulus, and when he, with several others, escaped to Rome, his father so severely reproached him for his cowardice, that the young man put an end to his life. (Valer. Max., v. 8, 4.) In 100 B.C. Scaurus received the office of præfectus annonæ, of which the senate had deprived L. Saturninus, and in the ensuing mutiny Scaurus defended the senatorial party. (Cic., *Pro Rubir.*, 7.) During the latter years of his life he was much harassed by his personal enemies, though their charges, especially those which referred to his avarice, may not have been unfounded. At the time when he was a member of the college of augurs, he refused to admit Cn. Domitius Aenobarbus into the college, and was therefore accused by him of having caused the neglect of the sacra of the Roman people at Lanuvium. Scaurus escaped punishment, though with great difficulty. (Ascon. *in Scaurian.*, p. 21, Orelli.) A short time afterwards, Q. Servilius Cæpio brought against him the charge of having enriched himself in an unlawful manner during an embassy in Asia, but Scaurus again escaped by bringing another accusation against Cæpio. The latter however, to avenge himself, in the year 90 B.C., induced the tribune Q. Varius to accuse Scaurus of having instigated the Italian allies to take up arms; but the bold manner in which Scaurus denied the charge, induced Varius to withdraw his accusation. (Aurel. Vict., c.; Ascon., c., p. 22.) It must have been soon after this event that Scaurus died, for we know that in the year 88 B.C. his widow became the wife of Sulla.

If we were to judge of Scaurus according to the opinion expressed by Cicero in several of his works, we must consider him one of the first of the Romans: Cicero at least considered him as the greatest man of his age. This partiality of Cicero for Scaurus arose partly from both of them belonging to the aristocratical party, and partly from the circumstance that Cicero, when a youth, had been introduced into his house, and the impression which the grave and proud aristocrat then made upon the young man was never effaced. Scaurus possessed some of the stern virtues of an antient Roman, and though he was an inflexible aristocrat, he enjoyed the highest esteem of the people as well as of the senate, which is shown from the fact that all the charges brought against him fell to the ground. Although originally poor, he had in the latter years of his life amassed immense wealth. The character which Sallust gives of him is that of a 'homo nobilis, impiger, factiosus, avidus potentiæ, honoris, divitiarum, ceterum vitia sua callide occultans;' and it was undoubtedly by the appearance of sincerity and integrity which he kept up throughout his life in such a masterly manner, that he gained the admiration of so many of his contemporaries. Scaurus also distinguished himself as an orator (Cic., *Brut.*, 29, 30), and wrote a work, in three books, containing the history of his own life, which however is now lost.

M. **Aemilius Scaurus**, son of the former, and afterwards son-in-law of Sulla, inherited only the bad qualities of his father. He increased his wealth during the proscriptions of Sulla; and during the war against Mithridates, when he served as quæstor in the camp of Pompey, he disgraced his name by accepting bribes for declaring himself in favour of Aristobulus against Hyrcanus in Jerusalem. Pompey however gave him the province of Syria with three legions, and here he remained until 59 B.C. During this time he made a plundering inroad into the peaceful country of Aretas, who could only prevent Scaurus from committing further robberies by the enormous bribe of 300 talents. (Joseph., *Ant. Jud.*, xiv. 5.) After his return to Rome he obtained the curule ædileship, in the year in which P. Clodius was tribune, that is, 58 B.C. (Cic., *Pro Sext.*, 54.) The games which he exhibited on this occasion far surpassed everything which the Romans had seen (Plin., *Hist. Nat.*, xxxvi. 15), and involved him greatly in debt. (Ascon., *Argum. ad Scaurian.*) Soon after this he obtained the office of prætor, and in 35 B.C., during his administration of Sardinia, he extorted exorbitant sums from the inhabitants, in order to enable him to purchase the votes in the approaching election for the consulship. But when he came forward as a candidate, the Sardinians, through the person of the tribune P. Valerius Triarius, brought against him the charge of repetundæ, and other crimes were at the same time laid to his charge (34 B.C.). His position was dangerous in the highest degree. He was defended by six advocates, and among them Hortensius and Cicero. A great part of the speech which the latter made for him is still extant. But the exertions of his friends, his own tears and lamentations, and the remembrance of his father, induced the judices to acquit him. A few days afterwards he was accused of ambitus, and although Cicero defended him again, he was condemned, and went into exile.

M. Aemilius Scaurus the Younger is one of the worst specimens of Roman nobles towards the end of the republic, and his whole life is one uninterrupted series of crimes. He was despised by all good men, and gained the admiration of the populace only by his unbounded extravagance, for which he indemnified himself by plundering foreign countries. Notwithstanding all this, Cicero twice undertook the defence of this unprincipled man. It may be that Cicero's admiration for Scaurus the father induced him to attempt to save the name of Scaurus from disgrace. What Horace (*Carm.*, i. 12, 37) means in reckoning the Scauri among the greatest men of the republic, is wholly inconceivable.

M. **Aemilius Scaurus**, a son of the former, betrayed Sext. Pompeius, his own brother-in-law, in Asia, to the generals of Antony. After the battle of Actium he was taken prisoner, but pardoned for the sake of his mother Mucia. (Ascon., c.; Dion. Cass., li. 2.)

Mamercus Scaurus, a son of the former, and grandson of M. Aemilius Scaurus the Younger, was a good orator and poet, but a man of the most dissolute conduct. (Tacit., *Annal.*, vi. 29; Dion Cass., lviii. 24; Senec., *De Benef.*, iv. 31.) In the reign of Tiberius he was accused of high-treason, and, in the same reign (A.D. 34), of adultery with Livia. These charges may have been unfounded, but the real cause of his persecutions was some verses against the emperor, which his enemy Macro had inserted in one of the tragedies of Scaurus. To escape further persecution, he put an end to his life. Seneca (*Suasor.*, 2) calls him the last of the Scauri.

SCELIDOTHE'RIUM. [Megatheriidæ.]

SCELO'TES, Fitzinger's name for a genus of *Reptiles* placed by MM. Duméril and Bibron among the *Scincoidian Lizards*, with the following

Generic Character.—Nostrils lateral, each opening in two plates (the nasal and the rostral); a single supero-nasal plate situated across the muzzle, behind the rostral plate; teeth conical, simple; tongue flat, of an arrow-head shape, squamous, and notched at its point; palate not furnished with teeth, but with a longitudinal groove; auricular apertures very small; no anterior limbs; posterior feet divided into two unequal, unguiculated, subcylindrical toes, without dentilations; muzzle subcuneiform; sides rounded; tail conical, pointed; scales smooth.

In this genus the form, taking the first step towards the ophidian type, is entirely without the anterior extremities; but the posterior extremities still exist, and are each divided into two toes, the internal much shorter than the external; whereas in *Pygopus* [Bipes] all external appearance of toes is lost, although the posterior extremities are still retained.

Example, *Scelotes anguineus*, Fitz.; *Scelotes Linnæi*, Dum. et Bibr.; *Anguis Bipes*, Linn.

Description.—Coppery or bronzed yellow on the back and upper part of the tail; lateral parts of the body greyish; as many rows of small black points marked with a whitish dash in the middle as there are longitudinal bands of scales on the upper part and sides; all the lower parts greyish.

Locality.—Cape of Good Hope.

SCENE-PAINTING. With respect to the stage of the antient theatres very little is known, and even that is exceedingly indistinct, being founded not upon description, but merely on incidental allusions. Granting therefore that the antients employed some kind of temporary stage decoration suited to the subject of the piece, it is very questionable if it at all resembled our modern scenery. Indeed the stronger presumption is that it did not: while the width of their stages renders it difficult to understand how any scene painted upon a single piece of canvass of sufficient size could have been let down, or rather drawn up, as it is supposed the *aulæa* were, or otherwise changed during the performance; it is quite certain that, however contrived or executed, any kind of scenery like that of our modern theatres could not have produced the same degree of illusion. The very circumstance of the performance taking place in the open air, and in daylight, removes all doubt as to the great inferiority of scenic effect, especially when it is recollected that besides daylight there was sunshine also, consequently accidental shadows thrown from one side upon the stage and scene itself. In fact, without very strong positive proof, we may very well be excused for questioning if there was anything approaching to scenic illusion and stage effect in the dramatic exhibitions of the antients. Such doubt is further greatly strengthened by our knowing that so far from showing any proficiency in linear and aërial perspective, in powerful chiaroscuro, and in landscape composition, nearly all the remains and specimens of antient painting betray great ignorance of or disregard to them, yet they are precisely those branches of his art in which it is requisite that the scene-painter should be thoroughly skilled, and those which are most essential to his subjects. Without a thorough knowledge of these branches it is impossible to produce any tolerable imitation of buildings or landscape views, which in fact comprise nearly the whole of the scene-painter's province. Besides all this, it is evident that so far from exacting truth-like imitation, the antients overlooked many gross inconsistencies upon their stage; their tragic and comic masks were grotesquely unnatural, while, by enlarging the actors' heads and faces, they must have had the effect of diminishing rather than at all increasing their apparent stature, giving them the proportions of dwarfs with stunted bodies. Consequently, though we are very imperfectly acquainted with the stage performances and apparatus of the Greek and Roman theatres, the little that we do know is, as far as it goes, quite conclusive against any degree of scenic illusion having been reached.

With the rise and progress of scene-painting and stage-effect in modern times we are not much better acquainted, since no specimens of early scenery have been preserved, and only scanty, casual, and fragmentary notices relative to it have come down to us. From what is recorded of Baldassari Peruzzi's [PERUZZI] works of this class, and those of some other artists, it would seem that scene-painting was brought all at once to perfection about the time of Leo X. We suspect however that there is some exaggeration in such accounts, for all excellence is comparative, and the same degree of illusion which would now be thought not at all extraordinary would have seemed quite magical to those accustomed to very inferior attempts. Owing to want of historical record and accurate description, it is also very doubtful whether any considerable improvement took place in the general economy of the stage and everything connected with scenic apparatus, as well as in scene-painting. Some of Peruzzi's own designs for scenes are said to be still in existence, and were there engraved copies of them, or had other chefs-d'œuvre of the kind been so perpetuated and spread abroad, we should be able to decide where now we can only doubt. For much of his reputation with his contemporaries Inigo Jones was indebted to the fancy and talent he displayed not merely as a scene-painter, but in getting up pageants and masques, and planning the decorations and machinery for them. The descriptions however given of them are so quaint and bombastic, that they rather show how liberal others were of their admiration towards him, than convince us that Jones himself approached those scenic contrivances and effects which have since been produced. In fact we have little more than traditional report to depend upon, for there exists no history of theatrical painting and of the various improvements which have from time to time taken place in the decorations and apparatus of the stage.

Of this last, and of the quantity of hidden machinery requisite for expeditiously changing the scenes, as well as for effecting more complex displays in pieces of *spectacle*, we shall not here speak, but confine our remarks to the painted scenery alone. Beginning with what is technically the *drop-scene*, as being the simplest of all, we have merely to remark that it is no more than a picture or single painted surface let down by way of blind or curtain between the acts, so as to close up the opening of the proscenium. As it generally continues to be used for an indefinite time—the one at Covent Garden has been there ever since the theatre was rebuilt (1809)—the drop is more carefully executed than back scenes, which, showy as they may be in effect, are required only for a season, and are at a much greater distance from the spectators. As far too as pictorial effect and truth of perspective are concerned, a drop shows itself to far greater advantage than other scenery, which is composed of different pieces constituting what is called a set of scenes. These consist of the narrow upright pieces called *side scenes* or *wings*, of the narrow horizontal ones (*hanging-scenes* or *soffits*, painted to imitate a sky or ceiling, but chiefly intended to screen the space over the stage), and of the *back scene*. Backs again are of two kinds, viz. *rolling* scenes, which are let down from above, and *flats*, which are formed of two sliding scenes strained upon framing, like the wings, and meeting each other and uniting in the centre. These are employed when what are termed *practicable* scenes are required, that is, with doors, windows, &c., which admit of being used as real doors, &c.; or else when there is occasion that the 'flat' should suddenly open and discover another scene behind it. In addition to these, there are what are termed *open* flats, which are scenes cut out in places so that both the background is seen and the actors can pass through them. They are commonly used for the representation of groves or forests, but sometimes for interiors with open arches. There are besides what are technically known as *pieces*, narrow scenes placed obliquely on one side of the stage when it is wanted to show a cottage or corner of a house, with a *practicable* door in it. Lastly, there is *set scenery*, as it is termed, a species of stage decoration very recently introduced, where, instead of the usual wings ranged one behind the other, there is a single scene on each side extending from front to back, so that the stage is completely enclosed. By this means a more perfect representation of a room can be obtained than where wings are employed.

In fact side-scenes or wings can be regarded as little better than so many detached screens absolutely necessary to shut out from view the space on each side of the stage, since in themselves they rather detract from than at all aid illusion and effect; more especially in interiors, where what should represent a continuous wall or surface on either side is broken into several pieces, which are besides placed parallel to the back scene or flat, instead of being at right angles to it. If the scenery be viewed exactly from the centre and from the true perspective distance, the defect thus occasioned is not very striking or offensive; but if the spectator be near to the stage, or placed on one side of the house, the whole becomes more or less distorted, and the wings only so many disjointed fragments, so that all scenic illusion is destroyed, and should the back scene be at a considerable distance, no part of it will be visible to those in the boxes next the proscenium, but merely the range of wings on one side and the gaps between them.

Scene-painting is executed in *distemper*, that is, with colours mixed up with size, the design being first made in a sketch, which is accurately laid down to scale, and from which the perspective outlines are transferred to the larger surface. Instead of beginning with dead colouring and then gradually working up his picture, the artist puts in all his effects at once (as in fresco-painting)—the full tone of the lights and shadows, finishing as he proceeds, and merely retouching those parts afterwards which require additional depth or brilliancy. In this kind of painting, *bravura* of execution and strikingness of effect are indispensable, and nature must be rather exaggerated than the contrary; at the same time care must be taken lest mere gaudiness be substituted for brilliancy and richness. Further, as much of the costume of the piece depends upon him, it is important that the scene-painter should not only be well skilled in architectural delineation, but also well informed as to the styles of different countries and periods, so as to avoid those errors and anachronisms which are frequently committed, and which are sometimes so glaring that no beauty of execution can atone for them.

Much of the effect of scenery depends upon a skilful mode of lighting it; in which respect considerable improvements have taken place of late years, and the light is now occasionally thrown from above, as well as from the sides and the foot-lights. A variety of mechanical contrivances have also been brought to great perfection so as to imitate particular effects in the most deceptive manner, such as those of moonlight, where the moon breaks through the clouds and gleams upon water, &c., changes of the sky from clear to stormy, or the contrary, the sudden glare of fire, &c.

Though looked upon as a very subordinate branch of the pictorial art, many artists of superior ability have applied themselves to scene-painting. To the name of Peruzzi we may add those of Bibiena, Servandoni, Loutherbourg, Lambert, Rooker, Gonzago, Quaglio [QUAGLIO], Sanquirico, Gropius, Stanfield, and Roberts. The fate of the scene-painter however resembles that of the actor: splendid as his triumphs are, they are of short duration; after a time his works are suffered to disappear completely; nay, even while they are before the public, and excite admiration, it is not always that the artist himself is thought of, or comes in for much share of praise. Yet, though the performances of a Garrick or a Siddons cannot be perpetuated and handed down to posterity, those of the scene-painter may to a certain extent be preserved by engraving; and if not many, there are at least some productions of the class that will merit to be so rescued from oblivion. This has indeed occasionally been done in other countries; for instance, a series of scenes painted by Sanquirico for the La Scala theatre at Milan have been engraved and published, but we are not aware that anything of the kind by English artists has been given to the world in that shape.

SCEPA'CEÆ, a small natural order of plants belonging to the rectembryose group of incomplete Exogens. The plants of this order are trees having alternate coriaceous leaves, with membranous stipules, which form the scales of the bud. The flowers are diœcious; the males are arranged in catkins, the females in short axillary racemes. The calyx is inferior, 4-5-6 leaved, in one or two whorls; stamens 2-5, with 2-celled anthers; ovary with 2 cells, in each of which there are 2 ovules; no style; stigma, with 2 short emarginate lobes or 4-ringed ones; seeds single or 2, enveloped in a succulent aril; embryo green, in the axis of albumen. These plants are allied to Cupuliferæ and Betulaceæ in their amentaceous flowers, but their ariliate albuminous seeds and dehiscent 2-celled pericarp distinguish them from these as well as any other orders to which they may seem to have relation. They are natives of the tropical parts of India. The wood of one of the species, *Lepidostachys Roxburghi*, or Kokra, is used in India for various economical purposes on account of its hardness.

SCEPTIC (Σκεπτικός), one who doubts, who deliberates, who circumspects. Such is the primary meaning of the word, but like most words it has been wrested from its primary signification by ignorance or prejudice, and is now, beyond its philosophical meaning, used to express a dissenter from an established religion. In one sense it denotes a philosopher; for doubt is the first step in science; it is the refusal to take for granted any explanation of phenomena that may be offered, and the *circumspection* of the grounds and truth of this explanation. In common usage, Sceptic denotes, loosely enough, an atheist, deist, pantheist, &c., or, more precisely, the holder of any heterodox opinions. Common usage is here, as is usually the case, wrong. To set the matter in its true light, we must remark that scepticism is simply doubt, while heterodoxy is disbelief; something manifestly distinct from doubt, which is a mere oscillation of the mind between opinions; the belief of this moment passing into the contrary belief of the next; whereas disbelief is the belief in something contradictory. This latter definition of disbelief being new, we will briefly endeavour to substantiate it. Reid, and others of the Scotch school, class disbelief as an independent power of the mind, equally with belief. We hold that the two are one and the same power exercised on contrary opinions. Let us take a simple illustration: A believes that Mr. Jones is in the next room; B disbelieves it. Assent and dissent must here, as everywhere, be rigidly demarcated from belief and disbelief. A *believes*, that is, from certain indications (having heard him speak, or seen him enter) it is his firm conviction that Mr. Jones is in the next room. B *disbelieves*, that is, from certain indications (having seen him go out, or fancying he saw him in the street, or knowing that he must be elsewhere) it is his firm conviction that Mr. Jones is not in the next room. Now it is evident that this denial is identical with the belief that Mr. Jones is *elsewhere*, and *not* in the room. If he had no *belief* in his being *elsewhere*, how could he disbelieve his being in the room? Impossible. He might *dissent* from it from passion, for argument, or for the sake of deceiving others, but in his own mind he could not disbelieve: for belief is not voluntary; it is the irresistible result and conclusion of certain evidences or thoughts. But he might doubt his being in the room. And what would be passing in his mind then? Why, a constant oscillation between evidence and evidence. He might have heard Mr. Jones's voice, or a voice he thought like it; and he might have seen, or fancied he saw, Mr. Jones in the street; here the conflicting evidence being pretty equal, his mind must oscillate, *i.e.* he *doubts*. In this case he must either relinquish the subject altogether, or go into the next room to satisfy himself; for the mind cannot remain *passive;* its essence and condition is activity, and if it once be placed in contact with a subject, it must lean to one side or the other. It must believe a thing or disbelieve it (*i.e.* believe something else which is contradictory), or must oscillate—one moment believing this thing, and the next believing another thing. If then this distinction be borne in mind—if we have rightly demarcated doubt from disbelief—the erroneous application of sceptic in common usage will be obvious. An unbeliever and an infidel are convertible terms in ordinary language; but nothing can be more erroneous. An unbeliever, in a positive sense, is the believer in some *other* religion, and as dogmatic in his belief as the most orthodox (and hence the early Christians were called atheists by the Greeks, because they disbelieved in *their* gods), and might turn round upon the orthodox believer with the charge of unbelief in *his* religion. Thus a Mohammedan is an unbeliever to the Christians, and *vice versâ*. An *Infidel*, on the other hand, as the word implies, is one with no belief, a doubter, a sceptic. The Infidel, when truly such, does not dissent because he believes something else—not because he has a contrary faith—but because he cannot believe for any length of time either the one or the other; he oscillates between them. This last is the true sceptic; this he always remains; he doubts, he deliberates, he circumspects to the last day of his existence: as soon as he ceases to doubt, deliberate, and circumspect, and takes up a distinct faith, his character as a sceptic vanishes; he becomes a believer. When considering the great and awful subjects of religion or philosophy, the weakness of the human mind must ever keep it in this state of scepticism, when once it has renounced its faith in things higher than its own logic:—when once reason is set up as the standard, measure, and exponent of all things, the human being is lost in the shoreless sea of scepticism. Hence mathematicians and logicians have so often been sceptics when they have acknowledged no higher source of knowledge than their small 'discourse of reason, looking before and after.' History affords many a saddening spectacle

> 'Of poor humanity's afflicted logic,
> Struggling in vain with ruthless destiny.'

In one sense, there are few who are not sceptics on certain points; and on the other hand, few who can properly be designated as sceptics; for to deserve this they must *continue* in the state of doubt which admits of no affirmation. Most men begin, as was said of Descartes, in doubting everything, and end in believing everything. The few who have consistently preserved the character of sceptic have been among the most celebrated in the history of philosophy. [SCEPTICISM.]

SCEPTICISM (Σκέψις), doubt, deliberation, circumspection. There are two significations to this word: the one denoting doubt of *an* explanation of phenomena; the other the more precise indication of a certain class of philosophers who have *continued* sceptics, whose system of thought in its fundamental points ever remained sceptical. To this latter we alone direct ourselves.

Socrates has been commonly called the founder of this sect by the enunciation of his famous tenet,—all he knew was that he knew nothing. But this was more a limitation of the confidence of the Dogmatists and Sophists, and a confession of the weakness of the human understanding, than any fundamental scepticism, such as was subsequently embraced by Pyrrho and others; for though Socrates, more occupied with pulling down than building up, advanced few speculative opinions of his own, yet we agree with Schleiermacher in awarding to him the merit of having first posited the true idea of science (as the intercommunion of dialectics, physics, and ethics); and this one positive principle in his philosophy is sufficient alone to demarcate him from the sceptics. As well might Bacon be accused of scepticism, his position in the 'History of Philosophy' being very similar to that of Socrates. How different this is from the scepticism of Pyrrho,

> 'Who would not with a peremptory tone
> Assert the nose upon his face his own,'

and whose whole philosophy consisted in a suspension of judgment, or perpetual negation [PYRRHO], may be seen by a comparison with some definitions of scepticism by the philosophers themselves. Sextus Empiricus, the historian of the sect, defines it as 'the power (δύναμις) of opposing in all their contradiction the *sensuous representations* and the *conceptions of the mind* (φαινόμενα τε καὶ νοούμενα), and thus to induce perfect suspension of judgment' (*Sextus Emp. Pyrrho. Hypot.*, i. 1, 4); and Carneades denied the possibility of real knowledge of anything from the twofold relation of the representation (image-idea, φαντασία) to the object (τὸ φανταστόν), and to the mind (ὁ φαντασιούμενος), as the mind had no criterion of the truth: all that could be affirmed was mere probability (τὸ πιθανόν). Ænesidemus defines it as the recollection of opinions from the testimony of the senses or other evidence, by which means one dogma was opposed to another, and upon comparison all found useless and confused. (Brucker, *Instit. Philos.*, ii., c. 14, § 7.) From the fallaciousness of sense, the differences of sensuous perceptions in different organizations, the weakness of understanding, and the impossibility of diving beneath the appearances to the real causes of things, the sceptics deduced a system of indifference which became equally difficult to accept or refute. They maintained that every proposition requires a prior proposition to support it, and so on *ad infinitum;* or else it assumes some axiom which cannot be proved, and is to be taken for granted without demonstration, and consequently may be denied with the same force with which it is assumed. Further, that nothing can be known by means of itself, nor by means of something else, whilst that other remains unknown, and that other must either be unknown or known by means of something else, and so on *ad infinitum*. (Sextus Emp., i. 15.) This last is extremely subtle, and in itself is irresistible; but as Kant profoundly remarked, there is this fundamental flaw in absolute scepticism, 'that it gives out everything for appearance. It therefore distinguishes appearance from truth, and of course must have a mark of distinction; consequently presupposes a knowledge of the truth, thus contradicting itself.' The careful avoidance of any expression savouring of certainty—the using of the term *seems* for *is*—which was adopted by this sect, has been inimitably ridiculed with all his wit and vivacity by Molière (*Mariage Forcé*, act i., sc. 8); and indeed a system so unsatisfactory never could and never has taken much root except in minds of a very peculiar and indolent nature. The abnegation of man's proudest faculty, reason, the perpetual indecision on every point, so little accords with the fertile and prodigious activity and creative power of the mind, that the real professors of scepticism have been universally indolent, easy-natured, sensual men, with whom the speculative doubting was stimulus enough. Morhoff (*Polyhistor*, ii., lib. i., c. 6, and l. ii., c. ix.) gives an account of all the sceptical writers in his dull laborious way; Brucker and Enfield (*Hist. of Philos.*, i., b. ii., c. 16) give a more detailed account of their tenets. [Pyrrho.]

Of modern scepticism it is remarkable that it differs little from the antient, and that whatever strides philosophy may have taken in other departments, it has made little or none in that of doubt. The same clenching subtle arguments occurred to a Theætetus as to a Hume. However we will proceed to give a brief historical account of the attempts made to revive it.

Sanchez, a Portuguese physician, published in 1581 a treatise entitled 'De multum nobili et primâ universali Scientiâ quod nihil scitur' (on the excellent and first universal science that nothing is known), a rare and extraordinary work, containing the leading arguments of the sceptics propounded in an extravagant manner; but after many sweeping assertions on the impossibility of all science, he at last admits the possibility of truth, and hints very plainly that he himself has attained it. It is an evidence of the restless spirit of the times and the growing servility to the authority of Aristotle and his followers. But notwithstanding his natural confidence in his own exclusive perception of truth, Sanchez was a real sceptic. Jerom Hernhaym, an abbot of Prague, on the other hand, who wrote a work 'De Typho Generis Humani' (on the vain glory of human nature), in which he endeavours to expose the falsehood, presumption, and uncertainty of human science, is to be distinguished from Sanchez and the Pyrrhonists; he was a pseudo-sceptic, and his evident design was to depreciate human learning as inimical to divine wisdom, and to lead men wholly to rely upon religious faith.

Of a similar tendency is the celebrated work of Bishop Huet ('Essai sur la Faiblesse de l'Esprit humain'), in which, after exhibiting the principal points of the sceptic philosophy as given in Sextus Empiricus to prove the insufficiency of human knowledge, he falls back upon the consequent necessity of retiring within faith and being content with it. So palpable is the pretence of his scepticism, that besides being a devout and learned bishop, he was the author of 'Demonstratio Evangelica.' Yet with singular inconsistency he addressed this demonstration to the very understanding which he had so triumphantly asserted could *not* attain truth.

Bayle is, as Cousin remarks, the ideal of sceptics. [Bayle.]

Glanvill, whose 'Scepsis Scientifica, or Confest Ignorance the way to Science,' 'has hardly,' says Hallam, 'been seen by six living persons' (Hallam, *Lit. of Europe*, iv.), is the systematic sceptic of the seventeenth century, and as his work is altogether a curiosity from the rarity of its notice, the extraordinary nature of its contents, and from its author having been a clergyman and member of the Royal Society, and from his having one year afterwards published a book in favour of witchcraft, we shall take a rapid view of its contents. After surveying our ignorance in general and in particular, he begins chap. ix. with these remarkable passages —'The disease of our intellectuals is too great not to be its own evidence; and they that feel it not, are not less *sick*, but stupidly so. The weakness of human understanding all will confess, yet the confidence of most in their own reasonings practically disowns it; and it is easier to persuade them from other lapses than their own; so that while all complain of our ignorance and error, every one exempts himself.' . . . 'All opinions have their truth, and all have what is not so; and to say all are true and none, is no absurdity.' . . . 'Truth is never *single;* to know one will require the knowledge of many.' . . . 'Thus is truth *relative*, and little considerable can be obtained by catches. The painter cannot transcribe a face upon a transient view; it requires the information of a fixed and observant eye; and before we can reach an exact sight of truth's uniform perfections, this *fleeting transitory*, our life, is gone. So that we see the face of truth but as we do one another's when we walk the streets, in a careless *pass-by;* and the most diligent observers view but the back side of the hangings, the right one is on the other side of the grave.' These passages give a much better idea of Glanvill's style, illustration, and thought, than the random passages quoted by Hallam. He continues to examine the causes of our ignorance, which he places in 'the impostures and deceits of our senses,' chap. x., and well observes, 'Thus our reasons being innoculated on the sense, will retain a relish of the stock they grew on; and if we would endeavour after an unmixed knowledge, we must unlive our former lives, and undo in the *day* of our more advanced understandings what we had spun in the *nightmare* of our ignorance.' Chap. xi. contains illustrations of these deceptions. Chap. xii. another illustration, 'which is the translating the idea of our passions to things without us.' Chap. xiii. to xvi. on the fallacies of the understanding, how produced. Chap. xvii. to xxii. directed against Aristotelians. In chap. xxiii. we have a forethought of Hume's doctrine of causation. 'All knowledge of *causes* is *deductive*, for we know none by simple intuition, but through the mediation of their effects. So that we cannot conclude anything to be the cause of another but from its continual accompanying it; for the *causality* itself is *insensible*.' He further maintains that there is no demonstration but where the contrary is impossible, and that we can scarce conclude so of anything; and observes, in the spirit of Kant, 'Our demonstrations are levied upon principles of our *own*, not universal *nature*.' Causes he declares, in chap. xxi., are 'the alphabet of nature and science, and we cannot read without them;' and yet these causes we *cannot* know, 'as we know nothing but effects, and those by our senses.' 'Causes are so connected that we cannot know any without knowing all, and this is omniscience. From the above brief account of a work little known, it will be seen that its neglect has been undeserved, and that it is one of the most striking which belongs to the school. Brucker does not mention it, nor does Enfield.

Bishop Berkeley, so commonly classed with the philosophical sceptics upon that misconception of the term we have before adverted to, is to be regarded simply as a believer in another system of philosophy from that usually accepted. He denied the existence of an external world. [Berkeley.] His belief was in idealism. But although he in his own person was not a sceptic, yet the irresistible consequence of his system was an absolute scepticism, which Hume failed not to perceive. The question of an external world is in itself a matter of indifference. We are so constituted as to be affected in the same way as if it had this external reality; it is the *mendacity of consciousness*, the unconditional scepticism which must result from seeing the very foundation-stone of our intellect (consciousness) thus built upon sand, that fixes the importance of the question.

Hume was the greatest and the legitimate sceptic of the eighteenth century. His was genuine Pyrrhonism. He attacked the very foundations of our knowledge by contrasting with them their self-contradictions. 'The truth is,' observes Dugald Stewart, 'that whereas Berkeley was sincerely and *bonâ fide* an idealist, Hume's leading object was plainly to inculcate *universal scepticism*. In this respect the real scope of his arguments has, I think, been misunderstood by most if not by all his opponents. It evidently was *not*, as they seem to have supposed, to exalt reasoning in preference to our instinctive principles of belief, but by illustrating the contradictory conclusions to which our different faculties lead, to involve the whole subject in the same suspicious darkness, and to set their evidence aside as good for nothing.' (*Essays*, ii., c. 1.) Hume accepted Berkeley's arguments in disproof of external reality, but he went still farther; after denying a *substantive world* (consciousness being concerned only with ideas or representations), he denied on the same ground a *substantive mind*. For, he asks, as we know but impressions and ideas, how can we know that there is anything *more* than these? These are the substance and limit of our knowledge. The mind itself has no distinct, energetic, *substantive* existence—it is but a *succession of ideas*. This is the doctrine expounded by Theætetus the Sophist, in Plato: 'There can be nothing true, nothing existent, distinct from the mind's own perceptions' (*τὰ φαινόμενα ἑκάστῳ ταῦτα καὶ εἶναι*). In truth the assumption of an external reality upon any grounds hitherto proposed is gratuitous and questionable. In the fact of perception it is assumed that there is—1, the consciousness; and, 2, the exciting external cause. But upon a patient and rigid interrogation of consciousness, all we find in it, as a fact, is a change in our state of being; beyond this no other element is *given*, but *assumed*. Now the question can never be—whether we *are* conscious of a change of being (since change is the condition of consciousness, and the individual consciousness is proof of itself), but whether, as the sceptic requires to know, we have or can have any *knowledge* or *consciousness* of this external exciting cause in itself. This we must give up. It being admitted that we are influenced by externals mediately (*i.e.* in *representation*), therefore our consciousness is of the *ideas*, not of the *objects themselves*. All that we really know is our own consciousness—our change of being—but we remain ignorant whether that change proceed from an *evolution of being itself*, or from the correlation of being and an external object. The reasonings of Reid, Stewart, Brown, &c. against this doctrine are most puerile. Stewart alone seems to have comprehended it in some of its aspects, but he nowhere fairly exposes and refutes it. If Hume is to be refuted, it must be, as Kant plainly saw, by a reconsideration of the very elements of perception, and an investigation of the received doctrines which Hume, assuming as established, employed as first principles. This was the work of Kant. Since the time of Hume there has been no legitimate sceptic.

SCEPTRE, from the Greek *skeptron* (*σκῆπτρον*), a staff, or rod, carried by princes as the ensign of judicial and sovereign power: whence in Homer it is accounted sacred, and the most solemn oaths sworn by it. The reader who desires to know the different forms in which the sceptre is represented upon antient coins, may consult Rasche's 'Lexicon Rei Nummariæ,' v. *Sceptrum.* Le Gendre tells us ('Nouvelle Histoire de France,' 8vo., Paris, 1719, tom. ii., p. 116) that with the kings of France of the first race the sceptre was a golden rod as tall as the king himself. The sceptre, as an ensign of royalty, is of greater antiquity than the crown.

SCHAFFHAUSEN (*Schaffhouse*, in French), one of the cantons of the Swiss confederation, is situated north of the Rhine, and is bounded on the north, east, and west by the grand duchy of Baden, and on the south by the cantons of Thurgau and Zürich, from which it is separated by the Rhine. It is one of the smaller cantons of Switzerland; the area is computed at 153 English square miles, and the population, by the census of 1834, was 32,268. The people profess the Reformed religion. The language of the country is a dialect of the German, resembling that of Suabia. The surface of the canton is hilly, and the soil is mostly calcareous. The general slope of the valleys is southwards towards the Rhine, which drains the whole country. Agriculture constitutes the chief occupation of the people; the country produces corn, wine, flax, hemp, and fruits, especially cherries. The climate is mild, compared with other parts of Switzerland. The manufactures consist of leather, steel, cotton-spinning, and distilling of kirschwasser. The canton has iron-mines, from which about 30,000 hundredweight of iron is yearly extracted. Most of the ore is smelted in the furnaces of Laufen near the fall of the Rhine.

The canton is divided into six districts: Schaffhausen, Stein, Thayngen, Neunkirch, Unterhallau, and Schleitheim. The only towns of the canton are Schaffhausen, Stein, and Neunkirch, but there are many villages and hamlets. The government was formerly like that of most Swiss cantons, that is to say, the citizens of the head town were the legislators, and the country population was subject to them; but by the new constitution of 1831 the democratic principle has become established.

All citizens of the canton who are twenty years of age are electors. Paupers, bankrupts, and criminals are deprived of the franchise. Foreigners who purchase the bourgeoisie, or freedom of one of the communes of the canton, become entitled to the elective franchise after five years. The legislative body, called the great council, consists of seventy-eight members. The town of Schaffhausen returns eighteen deputies, one for every 381 souls, and the rest of the canton returns sixty, at the rate of one for every 423 souls. This is the only privilege which the town still retains. Candidates for seats in the great council must be electors, and twenty-five years of age. Father and son, or two brothers, cannot sit together in the council. The little council, or executive, consists of nine members chosen by the great council; the members must be at least thirty years of age. The president of the little council is styled burgomaster. Both the great and little council are renewed every four years.

The revenues of the canton amount to 150,000 florins, derived from an income tax, a house tax, patents, the monopoly of salt, which belongs to government, as well as the cantonal forests.

The town of Schaffhausen is built on the side of a hill sloping to the bank of the Rhine, and is about 1200 feet above the sea. It is surrounded by walls flanked with towers, and has a fort, the vaults of which are bomb-proof. The streets are irregular, and most of the houses are old looking, but many are modern and handsome. The most remarkable buildings are the cathedral, the church of St. John, the town-house, and the arsenal. Schaffhausen has a college with ten professors, a gymnasium, several elementary schools, and an orphan asylum. The town library has become possessed of the library of John Müller, the historian of Switzerland. There is a society for the encouragement of agriculture, a Bible Society, and a Society of Beneficence, which has founded a savings'-bank. There are at Schaffhausen several mercantile firms who do considerable business, especially in colonial articles, which are introduced from Germany. The population is about 6800. The curious bridge of one arch, of 360 feet span, was destroyed by the French in 1799, and has been replaced by a common wooden bridge.

Schaffhausen was originally a hamlet of boatmen, and a place for unloading the goods which came down from the lake of Constance by the Rhine, the boats being obliged to stop here on account of the falls in the river below the town; and hence its name 'Scapha.' In the eleventh century a large monastery being built in the neighbourhood, a town afterwards grew around it, and in the thirteenth century it was walled, and obtained the rank of an imperial town. In 1330 it came into the possession of the House of Austria, but in the fifteenth century it recovered its independence, and allied itself to the Swiss cantons; and in 1501 it was received as a member of the Confederation.

The small town of Stein, which is situated at the outlet of the Rhine from the Untersee, or lower lake of Constance, has a handsome bridge over the Rhine, and some remarkable old buildings. It carries on a considerable trade in wine. Neunkirch is a small walled town, with 1200 inhabitants.

SCHALCKEN, GODFREY, was born at Dort, in 1643 His father, who was rector of the college in that town, intended him for one of the learned professions; but finding that he had a decided inclination to painting, he placed him under Solomon van Hoogstraten. He was afterwards for several years a pupil of Gerard Douw, whose style and manner of handling he very successfully imitated in small pictures of domestic scenes, chiefly represented by candlelight. After leaving Douw, he attempted to elevate his style by studying the works of Rembrandt, but finding himself unequal to the task, he returned to his original manner, and his pictures were eagerly bought. He painted in a variety of manners, but he was most eminently successful in candlelight pieces.

Some English gentlemen encouraged him to visit England, where he met with great success, till he attempted portraits on a large scale, in which he proved so inferior to Kneller, that he injured his reputation; but happily he soon became sensible of his error, and again painted on a small scale. It is to be regretted that though in his pencilling he is almost equal to Mieris or Vanderwerf, he is often incorrect in his drawing of the figure, and he also appears to have copied nature precisely as he saw it, without attempting even to give a graceful air to his subjects; hence in his portraits of women he was not so successful as in those of men. The subjects of his male pictures are well composed. On leaving England, he retired to the Hague, where he practised with great success till his death in 1706. There are three capital pictures by this artist in the collection of his late majesty George IV.

SCHATZ, GEORGE, born at Gotha, November 1, 1763, was a German writer deservedly esteemed in his day both as an original writer and a critic. Being of a delicate constitution, he preferred books to the society and amusements of other boys of his age; but although devoted to reading, and to a species of it seldom taken up by the young, he could not submit to formal study. He therefore gained little by his residence at the university of Jena, where it was intended he should apply himself to jurisprudence, but he occupied himself with Italian literature and poetry; and planned a translation of Tasso, and another of Macchiavelli's 'History of Florence,' which last he afterwards nearly completed. The death of his father left him at liberty to return to Gotha, where he thenceforth almost continually resided. He now set about diligently studying almost every European language and literature, in order to become acquainted with their character and with the best writers and the chief productions in them. By this means he acquired no less valuable than extensive stores of reading, which enabled him to supply a number of excellent essays and papers to different literary journals, including those on Ercilla and Camoens, in the supplement to Sulzer's 'Theorie der Schönen Künste.' While his more finished pieces of criticism of that kind possess a permanent interest, his 'reviews' on the productions of the day were calculated to serve the cause of good taste, and generally displayed talent, shrewdness, and humour, that, if employed on less fugitive subjects, would have earned a very high reputation for the writer.

His original productions are not many, neither do they belong to the highest species of poetry. Nevertheless in his prose fables he is second only to Lessing, while in his sonnets and madrigals he shows himself rather the rival than the imitator of Petrarch. Many of his minor pieces are indeed mere trifles, but are distinguished by that captivating charm of manner which frequently constitutes almost the sole difference between prosy rhyming and highly wrought poetry. That he should have executed comparatively so little, while gifted with powers to excel, ceases to be matter of astonishment or reproach, when it is considered that he died in his thirty-second year, March 3, 1795.

SCHAUENBURG is a province of the electorate of Hesse-Cassel, which is entirely detached from the rest of the territory, and is situated between 51° 56′ and 52° 35′ N. lat., and between 9° 15′ and 9° 33′ E. long. It is bounded on the north-east and south by Hanover, on the south-west by Lippe Detmold and Westphalia, and on the west by Schauenburg-Lippe: the area is 192 square miles. The surface is undulating, but there are some extensive plains. The soil is light, and on the banks of the Weser very fertile. The Süntel mountain in the east, the Deister on the north-east, and the Bückeberg on the west, are calcareous mountains of no great elevation, all clothed with fine forests. The Weser flows through a considerable part of the province, and all the smaller streams are its tributaries, either directly or indirectly, by means of the Leina. The climate is temperate, rather dry than damp, resembling that of Westphalia. The parts adjacent to the Weser produce corn, especially rye, barley, and oats, in abundance, and a considerable quantity is exported. The inhabitants raise potatoes, and all kinds of culinary vegetables, flax, and rapeseed. The forests are 75,000 acres in extent, and furnish timber for home consumption and for exportation. There is excellent pasturage and a fine breed of cattle. Domestic animals, game, and fish are not abundant. The minerals are salt, freestone, and coals, which are the best in all this part of Germany. Properly speaking, there are no manufactures. The province has its own separate government. The population is about 26,000 Lutherans and 2000 Calvinists, between 200 and 300 Jews, and a few Roman Catholics. The chief place is Rinteln, a tolerably well-built town upon the Weser, over which there is a bridge of boats, and which is here joined by the Exter. It lies in a pleasant country, has one gymnasium, one Lutheran and one Calvinist church, an old castle, and 3200 inhabitants.

SCHAUENBURG-LIPPE. This principality is sometimes called Schaumburg-Lippe, which, though used occasionally in official documents, is stated by Hassel to be incorrect. It consists, 1, of a portion of the county of Schauenburg, between 52° 11′ and 52° 30′ N. lat., and between 9° and 9° 25′ E. long.; it is bounded on the north and north-east by the Hanoverian province of Calenburg, on the east and south-east by the Hessian province of Schauenburg, and on the south-west and west by the Prussian province of Westphalia; and 2, of a part of the county of Lippe, namely, the bailiwicks of Blomberg and Alverdissen. The area is 210 square miles. The principality contains a few small streams. The face of the country is partly level, and partly mountainous, especially on the south-east, where the Bückeberg, a wooded mountain-chain, enters it. The country produces abundance of corn, pulse, flax, hemp, rapeseed, potatoes, and fruit. The minerals are coals, salt, gypsum, limestone and good building-stone. There is a good breed of cattle. There are no manufactures, but the country-people spin some yarn, and weave linen for their own use. The population of the principality is 24,000 Lutherans, 3600 Calvinists, and about 100 Roman Catholics. The revenues are about 21,000*l.* sterling, chiefly arising from the domains, the taxes being moderate. There are no debts, for on the close of the Assembly of the Estates, in 1818, the prince undertook to pay from his private property the debts, which amounted to above 20,000*l.* sterling. He also contributes one-tenth to all extraordinary contributions, both in money and kind, in peace and war. His highness, as a member of the German confederation, has one vote in conjunction with Hohenzollern and some other princes in the select council, and one vote of his own in the full council. The contingent to the army of the Confederation is 2040 men.

Bückeburg, the capital, is a well built town, situated at the foot of the Harz mountains, on the banks of a small stream called the Aue. It contains a palace, the residence of the prince, formerly surrounded with ramparts, which are now converted into public promenades and gardens. There are in the town one Lutheran and one Calvinist church, a gymnasium, 400 well built houses, and 2000 inhabitants.

SCHAUMBURG, SCHAUMBURG-LIPPE. [Schauenburg, Schauenburg-Lippe.]

SCHEELE, CHARLES WILLIAM, an illustrious chemist, who was born at Stralsund in Pomerania, in December, 1742, where his father was a tradesman. He was educated first in a private academy in his native town, and afterwards in a public school. Having a desire to study pharmacy, he was apprenticed to an apothecary at Göttenburg, with whom he remained eight years, during which period he acquired much valuable chemical information. In 1773 he removed to Upsal, where he became acquainted with Bergman, who became his friend and patron, and Scheele's publication entitled 'Chemical Observations and Experiments on Air and Fire' is prefaced by an introduction from the pen of Bergman. Observing that fire could not be maintained without the presence of air, Scheele turned his attention to its analysis; and he found that what was then called liver of sulphur and some other substances occasioned a diminution of the atmospheric air to which they were exposed, to about four-fifths of its original volume. He afterwards obtained oxygen gas, or, as he called it, *empyreal air*, by decomposing nitric acid, and by other processes; and he showed that this air was totally absorbable by liver of sulphur, and that upon adding as much of this gas to the residuum of the air which had been acted upon by liver of sulphur as had been absorbed by it, atmospheric air was reproduced. He found that the flame of burning hydrogen gas produced a similar diminution in the bulk of the air to that occasioned by the action of liver of sulphur.

It will be observed that, like Priestley, he discovered oxygen gas; and though not so early, yet, as Priestley himself admits, without any knowledge of what he had previously achieved.

Another and most important discovery which we owe to the labours of Scheele, is the elementary gaseous body now called chlorine, but by him named dephlogisticated marine acid. If we substitute, as has been very commonly done, hydrogen for phlogiston, the views of the discoverer will be perfectly intelligible and quite correct; for it is now well known that when hydrogen is abstracted from marine (now called hydrochloric) acid, chlorine is obtained; and on the contrary, when hydrogen is combined with chlorine, marine acid is produced.

One of Scheele's first discoveries was that of tartaric acid, and he pointed out the mode of preparation, and this, with slight alterations, is still adopted: this was in 1770, and in the following year his paper on fluoric acid appeared in the Memoirs of the Stockholm Academy. He at first erroneously supposed that the silica which he obtained in the operation of preparing this acid was a compound of fluoric acid and water; but when the inaccuracy of this opinion was proved by other experiments, he gave it up.

In 1774 his experiments in manganese appeared in the Memoirs above mentioned, and it was during his researches on this metal that he discovered two bodies not previously known, namely, chlorine, already mentioned, and the earthy substance barytes.

In the following year he proposed a new method of preparing benzoic acid, and also published an essay on arsenic and its acid; and a few years afterwards he made known the preparation of arsenite of copper, since largely employed as a pigment under the name of Scheele's or mineral green. In subsequent years he published important papers on molybdena and plumbago; on milk, and the lactic acid which it contains when sour; and also on the metal tungsten.

In 1782 his experiments on Prussian blue appeared: these were instituted for the purpose of discovering the nature of the colouring-matter, and they display great ingenuity, and sagacity in an uncommon degree. It resulted from these researches that the Prussic acid, or the colouring principle, was a compound of azote and carbon.

He pointed out, in 1784, a process for preparing citric acid in a pure crystalline form; and not long afterwards he described processes by which malic and gallic acids might be obtained in a state of purity.

These are the most important of Scheele's discoveries; and, with scarcely any other exception than perhaps Priestley, no person has pointed out so many new substances. It is to be observed that his labours were conducted under very disadvantageous circumstances, and during a life of short continuance, for he died at the early age of forty-four years, at Köping near Stockholm, in 1786.

SCHEFFER, JOHN, was born in 1621 at Strassburg, and is said to have been a descendant of Peter Schöffer, one of the inventors of the art of printing. The principal objects of his study were the antient languages and history, in both of which he made such extraordinary progress, that in the year 1643 he published a very learned work, 'De Varietate Navium apud Veteres,' in 4to. The frequent disturbances in Alsace induced him to seek a more quiet home in a foreign country, and he went to Sweden, where, in 1648, he obtained a professorship in the university of Upsala. He died in 1679.

The life of Scheffer must have been one of incessant labour; for besides a great number of antient authors which he edited with notes and emendations, such as Aelian's 'Variae Historiae,' Phædrus, Arrian's 'Tactica,' a newly discovered fragment of Petronius, Aphthonius, Hyginus, Justin, Jul. Obsequens, and others, he wrote a great number of original works on various subjects, some of which have not yet been superseded by other works. The following list contains the most important among them:—'Agrippa Liberator, sive Diatriba de Novis Tabulis,' Strassb., 1645, 8vo., a curious work on the supposed custom of cancelling debts at Rome, in order to prevent insurrections of the poor; 'De Stylo ad Consuetudinem Veterum Liber Singularis,' Upsala, 1653, 8vo.; 'De Militia Navali Veterum Libri Quatuor,' 1654, 4to. This book also contains his earliest dissertation, 'Of the Ships of the Antients,' in a somewhat altered form. 'De Antiquorum Torquibus Syntagma,' Stockholm, 1659, 8vo.; a new edition with notes was published at Hamburg in 1707, 8vo.; 'De Natura et Constitutione Philosophiae Italicae seu Pythagoriae Liber Singularis,' Upsala, 1664 (reprinted at Wittemberg in 1701); 'Regnum Romanum, sive Dissertationes Politicae Septem in librum primum T. Livii, qui est de Regibus Romanorum,' Upsala, 1665, 4to.; 'Upsalia Antiqua, cuius occasione plurima in antiquitatibus borealibus et gentium vicinarum explicantur,' Upsala, 1666, 8vo.; 'Graphice, seu de Arte Pingendi Liber Singularis,' Nürnberg, 1669, 8vo.; 'De Re Vehiculari Veterum Libri Duo, accedit Pyrrhi Ligorii Fragmentum ex ejus libro de familiis Romanis, nunc primum editum Italice cum Lat. versione et notis,' Frankf., 1671, 4to.; this is still the best work on the subject. 'Memorabilia Sueticae Gentis,' Hamb., 1670; 'De Fabrica Triremium Epistola;' this little work was published at Eleutheropolis (Amsterdam), under the name of Constant Opelius, and is a criticism on a work of Meibom on the same subject. 'Lapponia, seu Gentis Regionisque Lapponicae Descriptio accurata,' Frankf., 1673, 4to.; 'Lectiones Academicae, seu Notae in Scriptores aliquot Latinos et Graecos,' Hamb. 1675 (it was reprinted in 1698 at Amsterdam, under the title 'Schefferi Miscellanea'); 'De Situ et Vocabulo Upsaliae, Epistola defensoria adversus Olaum Verelium,' Stockholm, 1677, 8vo.; 'De antiquis verisque Regni Sueciae Insignibus,' Stockholm, 1678, 4to.; 'Suecia Literata, seu de Scriptis et Scriptoribus Gentis Sueciae,' Stockholm, 1680. A new edition of this work with important additions by J. Moller, was published in 1698 at Hamburg. In 1781 the Society for Education at Upsala proposed a prize for the best eulogium on John Scheffer, and the prize was awarded to that of Eric Michel Fant, which was published at Stockholm in 1783, 8vo. Several of the works of Scheffer are incorporated in the 'Thesauri of Roman Antiquities.'

SCHEFFER, HENRY THEOPHILUS, the grandson of the former, was born at Stockholm in 1710. He studied mathematics, natural history, and chemistry at Upsala, under very eminent professors of this university. He afterwards established, at his own expense, a laboratory in Upsala, and made a number of very useful experiments. It was chiefly the analysis of such metals and plants as are used for dyeing, on which he bestowed his particular attention. He was a member of the Academy of Sciences at Stockholm, and furnished many valuable papers which are printed in the Transactions of the Academy. He also delivered a course of lectures on chemistry at Stockholm, which were published in 1776, by Bergman. Scheffer died in 1759.

SCHEID, EVERARD, more generally known under his Latin name *Scheidius*, a philologist who distinguished himself by his deep acquaintance with the Oriental languages, was born at Arnheim in Holland, in 1742. From his early youth he devoted all his time to the acquisition of the Eastern languages, principally the Hebrew and Arabic, of which he soon became a consummate master. In 1768 he was appointed professor at the university of Harderwyck. On his removal to Leyden he succeeded J. Albert Schultens in the chair of Oriental languages; though he did not long enjoy this post, for he died in 1795, soon after his appointment. Besides his edition of the 'Minerva de Causis Linguæ Latinæ,' by Sanchez [Sanchez], Scheid left several works on Eastern literature which are highly valued by scholars. The following are the titles of some: 'Primæ Lineæ Institutionum, sive Specimen Grammaticæ Arabicæ,' Leyden, 1779, 4to.; 'Ebn Doreydi Kassida, sive Idyllium Arabicum, cum Scholiis,' ibid., 1786, 4to.; 'Oratio de Fontibus Literaturæ Arabicæ,' ibid., 1767, 4to. He published also 'Glossarium Arabico-Latinum Manuale,' Leyden, 1769, 4to.; being an abridgment of the large Arabic and Latin lexicon by the celebrated James Golius. Scheid had projected a new Dutch translation of the Bible and other works, which death prevented him from executing.

SCHEINER, CHRISTOPHER, a learned German astronomer, was born at Wald near Mundelheim in Suabia, in 1575, and became a member of the order of Jesuits in 1595. Having early made proficiency in mathematics and astronomy, he was appointed professor of those sciences at Ingolstadt, and he afterwards gave instruction in them at Fribourg and Rome. The principal circumstance by which the life of this philosopher is distinguished is a discovery, in 1611, of the spots on the sun, independent of that which had been made by Galileo a few months previously. This discovery is announced in three letters addressed by Scheiner to Velser, the senator of Augsburg, in which the writer states that, in the beginning of the year, while looking at the sun through a telescope, he perceived on its disk some dark spots; and that in the following month of October, on repeating the observations, he ascertained that the spots had a movement across the disk. It appears from the same letters that P. Scheiner at first thought the spots to be small planets revolving about the sun; an idea which was afterwards maintained by P. Malapertius in a work published in 1627.

An expression in a letter from Velser to Galileo puts it out of doubt that the discovery made by the Italian philosopher was known in Germany when the letters of Scheiner were published (1612); and it must be further admitted that to Galileo belongs the merit of having, from the first, considered the spots of the sun as adhering to the disk of the luminary, and of having drawn from the regularity of their motions an argument for the rotation of the sun about its axis. It is but just however to Scheiner to state that he almost immediately abandoned his first hypothesis, and that we are indebted to him for numerous observations on the spots, as well as of Jupiter's satellites. The observations were published at Rome in 1630, in a work which, from being dedicated to Prince Orsini, was entitled 'Rosa Ursina.'

Scheiner, unfortunately for his fame as a philosopher, united himself with those persons who, at that time, opposed the hypothesis of Copernicus, and he published in 1614, at Ingolstadt, a volume entitled 'Disquisitiones Mathematicæ,' in which he argues in favour of the opinion that the earth is at rest in the centre of the universe. Besides these works Scheiner published, in 1616, a treatise on gnomonics; and, in 1617, a tract on celestial refraction, in which he assigns the true cause of the elliptical form assumed by the disk of the sun when near the horizon. He also published a treatise on optics in 1619. Scheiner was the inventor of the pantograph, and he has given a description of the instrument in a tract entitled *Pantographice*, &c., Rome, 1631.

This distinguished Jesuit, after quitting Rome, became rector of Neiss in Silesia: he gave lessons in mathematics to the archduke Maximilian, and at length he became confessor to the archduke Charles. He died of apoplexy in July, 1650, leaving the character of having been a man of agreeable manners as well as a laborious student.

SCHELDE (in Dutch and German), **ESCAUT** (in French), the *Scaldis* of the Romans, rises in France, in the department of Aisne, and flows northward to Cambray and Bouchain, in the department of Nord, receiving the Sensee on the left bank. From Bouchain it flows north-east by Valenciennes to Condé, and then north-west to Tournay in Belgium, receiving the Scarpe on the left bank between these two towns. From Tournay the Schelde flows north-north-west for a short distance, and then north-north-east by Oudenarde (Oudenaarden or Audenarde) to Ghent, where it receives the Lys on the left bank. From Ghent its course is eastward to Dendermonde, where it receives the Dender on the right bank; and then winding to the north-east, reaches Antwerp, receiving the Rupel on the right bank some miles above that city. From Antwerp its course is north-west, until, just on the border of Belgium and Holland, it separates into two principal arms, the Hond or West Schelde, and the East Schelde, by which it flows into the North Sea. The direction of these two arms is westward (the East Schelde being the more northerly), and they enclose between them a group of low islands, consisting of South Beveland, North Beveland, Wolfersdyk, and Walcheren, separated from each other by narrow channels. The fortress of Vlissingen, better known in England as Flushing, in the island of Walcheren, guards the entrance of the West Schelde. Branches from the West Schelde enclose the islands of Hulst, Axel, Oostburg, and Cadsand or Cassandria, which line the southern bank of that arm; while branches from the East Schelde, uniting with the Maas or Meuse, enclose the islands of Tholen, Duiveland, and Schouen or Schouwen, which line the northern bank of this arm. The passage of the East Schelde is guarded by the fortress of Bergen-op-Zoom. The little island of Saeftingen is just at the separation of the two arms.

The total length of the Schelde is estimated at about 210 miles, of which about 60 belong to France, 110 to Belgium, and 40 to Holland. The navigation of the river commences at Cambray, only about 20 miles from its source. Boats of various sizes are employed in the upper part, and small merchantmen ascend to Ghent by the canal of Sasvan-Ghent, which is cut northward from Ghent into the West Schelde, and then by the Schelde as far as Oudenarde, and some of the smallest go even higher than that. The width of the river at Dendermonde is 600 feet, at Antwerp 1200 feet, at the mouth of the East Schelde 7 miles, and of the West Schelde nearly 10 miles. Ships of war can get up to Antwerp, where the tide rises 12 feet.

Of its affluents the Scarpe is navigable to Arras, 44 miles; the Lys to Aire, 106 miles; and the Durme (which joins it between Dendermonde and Antwerp, and is made navigable by the tide for nearly its whole length) to Lokeren, 12 or 15 miles; these are all on the left bank. The Dender is navigable to Ath, 44 miles; and the Rupel (formed by the junction of the Dyle, the Senne, and the Nethe) is navigable to the junction of the Demer with the Dyle, 24 miles, or about 30 miles to Herenthals on the Little Nethe, or Westerloo on the Great Nethe. These join the Schelde on the right bank. There are several canals connected with the Schelde and its affluents.

The navigation of the mouth of the Schelde is seriously impeded by large sand-banks; but the traffic on all parts of the river is very great. The basin is not very large, and is bounded by low hills, which are ramifications of the heights of Ardennes.

SCHE'LESTADT, SE'LESTAT, or SCHLETTSTADT, a town in France in the department of Bas Rhin, 25 miles south-south-west of Strasburg. It was a place of importance, known to the Romans by a name variously written Ἔλκηβος (Elcebus) by Ptolemy, who gives it as one of the towns of the Τριβοκκοι (Tribocci), a German nation settled on the left bank of the Rhine; Elcebus or Elcebum, in the Antonine Itinerary, and Hellellum in the Peutinger Table. It was destroyed by Attila in his invasion of Gaul; and for a long time remained in a low condition, though Charlemagne and his successors had a palace here. In the thirteenth century it was walled and repeopled, and became one of the most important of the free and imperial cities of Alsace. In the Thirty Years' War it again suffered much; but since the reunion of Alsace with France it has gradually revived. In the course of the present century its population has doubled.

The town is pleasantly situated amidst the meadows watered by the Ill, and commands a prospect of the Vosges on the west; their slopes covered with vineyards, and their summits crowned with ruined castles. The town is fortified: it has three gates, three churches, two ranges of barracks, an hospital, a prison, a college, and a theatre. The houses are crowded together and generally ill built. The population in 1831 was 9384 for the town, or 9646 for the whole commune; in 1836 it was 9700 for the commune. The townsmen manufacture calicos and other cotton goods; 'metallic cloth,' a peculiar and valuable fabric; hosiery, soap, pottery, twine, potash, arms, &c. There are tan-yards and breweries; and four fairs are held in the year. Coal and potters'-clay are found in the neighbourhood.

Schelestadt is the capital of an arrondissement containing an area of 444 square miles, with a population, in 1831, of 131,295; in 1836, of 134,887. It comprehends 114 communes, and is divided into eight cantons or districts, each under the jurisdiction of a justice of the peace.

SCHE'LLER, J. J. G., was born in 1735 at Jhlow, a village in the electorate of Saxony. He was educated at the Thomas schule of Leipzig, and afterwards in the university of the same place. He studied under Ernesti, and devoted himself to theology and philology. In 1761 he was appointed head master of the public school at Lübber, and in 1772 to the rectorship of the gymnasium of Brieg, in which office he continued until his death in 1803.

Scheller is principally known as the author of a Latin dictionary (Latin and German, and German and Latin), the first edition of which was published at Leipzig, in 1783, and the second in 1788, 3 vols. 8vo. The third edition, which was very much improved and enlarged, appeared in 1804-5, in 7 vols. 8vo. This book was very much used at the time, as it was almost the only dictionary of practical utility that had been published in the German language. It has been translated into Dutch (Leyden, 1799, 2 vols. 4to., with a preface by Ruhnken), and, some years ago, into English also. Scheller also wrote a smaller Latin dictionary for the use of schools; the second (1812) and subsequent editions were revised and improved by Lünemann. Scheller's other works are, 'Præcepta Styli bene Latini' (a third edition of which appeared at Leipzig, 1797, in 2 vols. 8vo.), and a Latin Grammar ('Ausführliche Lateinische Sprachlehre') which went through three editions, Leipzig, 1779, 1790, and 1803. This grammar is a work of little value; it has been translated into English.

SCHE'LTOPUSIK or SHELTOPUSIK, the ordinary name for a genus of *Reptiles*, *Pseudopus* of Merrem.

Cuvier considered that the *Scheltopusik* was a serpent; and, in his last edition of the *Règne Animal*, he arranged it at the head of the *Orvets*, *Anguis* [BLIND WORM]; but most other herpetologists, indeed an exception does not occur to us, place it among the SAURIANS.

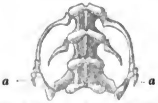
MM. Duméril and Bibron arrange the form under their *Chalcidian Lizards*, or *Cyclosaur Saurians*, with the following

Generic Character.—Tongue of an arrow-head shape, free and delicate for its anterior third only, notched triangularly in front, with granulous papillæ on the first third of its surface, and with filiform papillæ on the two last; teeth on the palate; intermaxillary teeth conical, simple; maxillary teeth subcylindrical or subtubercular; nostrils lateral, each opening in a single plate; a very small external auricular opening; eyelids; cephalic plates numerous; posterior limbs represented by two small scaly appendages, which are simple or slightly bifid, not pierced with pores, and situated one on the right and the other on the left of the vent; two rather deep lateral furrows; not the smallest fold under the neck.

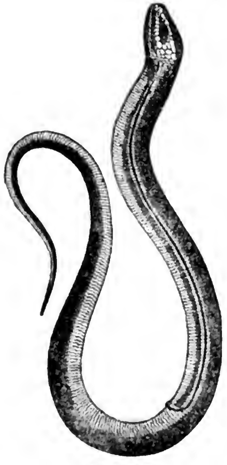
MM. Duméril and Bibron well observe, that if we were only to consider the form of their body, extremely elongated and deprived of feet as it is, like that of the Serpents, the Scheltopusiks would seem to have no right to occupy in a natural method the place which those zoologists assign to it, namely, among the *Ptychopleures*, between *Gerrhonotus* and OPHISAURUS, and consequently next to species which have limbs of as good conformation as the generality of Saurians. But, they remark, if *Ophisaurus* is not to come immediately next to *Gerrhonotus*, there is no other form which so nearly approaches the *Gerrhosaurs*, and particularly *Gerrhonotus*, in its internal and external organization, so closely indeed does it approach, that it might in some sort be said of the Scheltopusiks that they are apod *Gerrhonoti*. In both are found palatal teeth, a tongue covered with two sorts of papillæ, an external auricular orifice, cephalic plates in greater number than in the other Chalcidians, a well-defined longitudinal furrow on each side of the trunk, and finally, a regular system of scales which are homogeneous on the lower part of the body from the throat to the orifice of the cloaca. MM. Duméril and Bibron then point out some slight differences between the two genera, which, in their opinion, do not affect their general approximation.

The *Scheltopusik* has two lungs, but one is three or four times larger than the other.

The only species known is the *Pseudopus Pallasii*, Cuv.; *Le Bipède Sheltopusik* of Lacépède and others; *Lacerta Apus* of Gmelin; *Pseudopus serpentinus*, Bonap.



Pelvis of Scheltopusik, showing at a, a the rudiments of the posterior extremities.



The Scheltopusik.

Description.—The scales become osseous with age; on the neck, the back, and the sides they are subrhomboïdal; below, that is, on the throat, the breast, and the belly, they are hexagonal, wider than they are long, and slightly notched on their posterior border. In young subjects all the scales, with the exception of the gular, are surmounted with a strong carination; but by degrees, as the animal is developed, the carinæ are attenuated to such a degree that the scales of the dorsal region, and still more those of the abdominal region, preserve but a slight vestige of it; the caudal scales however remain constantly carinated. When the dorsal scales lose their carination, they become marked with longitudinal striæ, which are more or less strong in different individuals.

The Prince of Canino[*] describes the head and anterior part of the neck as being of a greyish-ash colour, whilst its posterior region is of the same tint as the trunk. The ground-colour of the upper part of the body is rusty chesnut verging on reddish. Each scale is dotted with a very great number of small blackish points. The colour of the back, in descending towards the sides, passes gradually into an ashy hue. The iris is golden green and the pupil black.

The colouring of the young is entirely different from that of the adults. They are greyish-brown above, and whitish-grey below. Above, their back is marked across with stripes, or rather with spots or chevrons of brown. There are brown stripes also from below upwards on the sides of their head and neck. There is one behind the nostril, a second under the eye, a third on the edge of the commissure of the lips, a fourth across the ear, and many others behind the last. The greater part of these stripes descend under the throat, where they join each other more or less regularly.

Geographical Distribution.—Wide. The Crimea. South of Siberia, Istria, the Morea, the whole of the Continent of Europe to the south, and the Mediterranean coasts of Africa, haunting thick herbage and grassy places.

The *Pseudopus D'Urvillii* of Cuvier and the *Pseudopus Fischeri* of Ménestriés are merely young individuals of the species above described.

The Prince of Canino[†] places the form in his family *Ophiosauridæ* and subfamily *Ophiosaurina*.

SCHEMNITZ (called in Hungarian *Selmecz-Banya*) a royal free town in the county of Honth, is the largest and most important of the Hungarian mining-towns. It is situated 2172 feet above the level of the sea, in a deep and narrow valley thickly wooded. The town is not large, but it has four extensive suburbs, part of which are two leagues distant. The population is about 8000 in the town, and between 9000 and 10,000 in the suburbs, most of whom are employed in the mines. Schemnitz was founded in the twelfth century, and, with the whole mining district of Northern Hungary, was entirely peopled with colonists from Flanders and Lower Saxony. This town is the centre of the mining district of Lower Hungary, which comprises fifteen towns. The mines formerly yielded annually 100,000 marks of silver, which is more than all Hungary now produces; and above 1800 marks of gold, which is equal to 132,000 ducats. From 1740 to 1773 the value of the precious metals was estimated at 70,000,000 of florins: at present the whole district does not produce annually above 400 marks of gold and from 60,000 to 80,000 marks of silver. The principal buildings are the town-hall, the two parish churches, the new Protestant church, which is a remarkably elegant edifice; the new palace, the residence of the civil governor; and the mining court-house. Of the public institutions the most worthy of notice are, a Roman Catholic and a Protestant gymnasium; two high schools, and the mining academy, founded in 1760, which is frequented by pupils from all parts of Europe; with the chemical laboratory, and a splendid mineralogical and geological collection. The elevated situation of the mines has made it necessary to construct reservoirs, at a very great expense, to receive the snow and rain water necessary to work the machinery. The works most worthy of notice are in the village of Windschacht, where there is an hydraulic machine which raises 97,545 cubic feet of pit water from the depth of 180 fathoms in four and twenty hours. Schemnitz is situated in 48° 30′ N. lat. and in 18° 50′ E. long.

SCHEPLER, LOUISA. [OBERLIN, J. F.]

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[*] 'Fauna Italica.'

[†] 'Amphibia Europæa,' in 'Memorie della Reale Academia delle Scienze di Torino,' Serie II., tom. ii., p. 385.

SCHERERITE occurs in acicular crystals and small translucent layers. Colour white or yellowish-white. Lustre pearly. Devoid of taste or smell; is very friable. It melts at 112° Fahrenheit, and distils at 194°. It is insoluble in water and alkaline solutions, and in alcohol unless it be heated, but it dissolves in æther and oil of turpentine. When exposed to fire it inflames, and is entirely dissipated, with a somewhat aromatic smell.

It occurs in beds of lignite at Uznach, near St. Gall in Switzerland, and also at Bagh in the same country.

Analysis by Macaire Prinsep:—Hydrogen, 24; Carbon, 73.

SCHEUCHZER. [SALAMANDRIDÆ—*Fossil.*]

SCHEVELING, or SCHEVENINGEN, is a beautiful village in the province of South Holland, on the German Ocean, north-west of the Hague, with which it communicates by a broad avenue of oaks and limes, perfectly straight and above two miles in length: there is likewise a canal from the Hague to Scheveningen. The town is protected from the sea by the downs; but in 1574 upwards of one hundred houses were swept away by a high flood. The place has been greatly improved of late years, and is now much frequented for sea-bathing. There is a small pavilion belonging to the queen; a fine orangery and water-works. The inhabitants, about 3000 in number, subsist chiefly by fishing, and have in a great measure retained their antient manners and costume.

SCHIAVONETTI, LUIGI, or LOUIS, was born at Bassano, in the Venetian states, April 1, 1765. He was the eldest son of a stationer, with a large family and limited means. Luigi very early displayed a talent for drawing, and at the age of thirteen was placed under Giulio Golini, or Goldini,* a painter of some eminence, who became much attached to his pupil. Golini died about three years after, and young Schiavonetti turned his attention to engraving, and received some instruction in the mechanical part of the art from a very indifferent engraver named Lorio. He was employed for a time in engraving for Count Remaudini, and appears to have aimed at the style of Bartolozzi, whose engravings in the chalk manner were then attracting much attention. His skill in imitating this great master led to a connection with an engraver named Testolini, who eventually induced him to remove from Bassano to London, where he resided for some time with Bartolozzi, and afterwards established himself. He profited much by his connection with Bartolozzi, and continued the exercise of his talents with increasing reputation until his death, on the 7th of June, 1810. Most of the works of Schiavonetti were small, though he executed some important plates, and was engaged, at the time of his death, on the large engraving of Stothard's 'Canterbury Pilgrimage,' which was finished by James Heath. Besides his more elaborate works, the free etchings of Blake's illustrations to Blair's 'Grave,' and the beautiful head of Blake prefixed to that work, are deservedly much admired. Like the eminent man whose manner he adopted, he was distinguished for the freedom and accuracy of his drawing. The private character of Schiavonetti was such as to ensure general respect, and his funeral was attended by the president and several members of the Royal Academy. His brother Niccolo engraved in conjunction with him, and did not long survive him. (*Life* by Cromek, in 'Gent. Mag.,' vol. lxxx., part 1, &c.)

SCHIAVO'NE, ANDREA, called *Medula*, was born at Sebenico in Dalmatia, in 1522. He was of obscure parentage, and was placed with a house-painter at Venice, where he employed his leisure time in studying from prints after Parmigiano, and in contemplating the works of Giorgione and Titian. The latter artist, having become acquainted with the poverty of Schiavone, and approving of his ability, employed him with Tintoretto and others in the grand works for the library of S. Marco, where three entire ceilings are said to be by his hand. He soon became the rival of Tintoretto, but although he was excellent as a colourist, his defective knowledge of drawing rendered him unable to compete successfully with that master; the work however which he painted for the church of Santa Croce, representing the Visitation of the Virgin to Elizabeth, gained him considerable reputation. Two of his most admired works are in the church of the Padri Teatini at Rimini, one of them the Nativity of our Lord, the other the Assumption of the Virgin. Schiavone died at Venice in 1582. The chief merit of this artist consists in his colouring, to which he seems to have sacrificed other requisites of his art. Still his attitudes and draperies are graceful, and his countenances, more especially of women, expressive; nor are his compositions deficient in variety and skill. There are several etchings by him, some from his own designs, and others after Raffaelle, Parmigiano, and other artists. (Lanzi, *Stor. Pitt.*; Bryan's *Dictionary*.)

SCHIDO'NI, or SCHEDONE, BARTOLOMEO, was born at Modena, in 1560. Malvasia reckons him among the disciples of the Caracci, but Fuseli seems to doubt the correctness of this assertion, observing that either his earliest performances must be unknown, or that he must have been a very short time with the Caracci, since it is difficult to find any trace of their style even in his largest works. However this may be, it is evident that he formed his style by a most attentive study of the works of Correggio, whose grace and delicacy he more nearly approached than any other of the numerous imitators of that great artist; and in the cathedral of Modena there is a picture of S. Geminiano resuscitating a dead child, which has often been mistaken for a work of Correggio. Schidoni's juvenile performances in the public edifices of Modena had gained him considerable reputation, when Runuccio, duke of Parma, appointed him his principal painter. He executed for the duke several historical subjects, much in the manner of Correggio, but was chiefly employed in painting the portraits of his patron and his family; he painted also the portraits of all the princes of the house of Modena, which were distinguished by so much taste and variety of attitude, and such delicacy of colouring, as caused him to be reckoned among the best masters in Italy. Schidoni had an elevated genius; his style is extremely elegant; his touch light and delicate; the airs of his heads graceful; his skill in the treatment of the chiaroscuro and his colouring are admirable, and all his works are exquisitely finished, but he is often incorrect in his drawing. The extraordinary beauty of his works would always cause them to be eagerly sought after, and they are accordingly held in the highest estimation, and their value is greatly enhanced by their extreme rarity. He died in 1616, at the age of fifty-six.

SCHIEDAM is a considerable town in the province of South Holland, in the kingdom of the Netherlands, situated in 51° 55′ N. lat. and 4° 24′ E. long., on the Schie, a small river or canal which runs from Delft, and falls into the Maas at Schiedam. The population consisted, in 1841, of 5672 males and 6349 females in all 12,051; of whom 7090 were Protestants, 4939 Roman Catholics and 32 Jews. The inhabitants are much engaged in the herring fishery, but the town is chiefly celebrated for its numerous distilleries of gin (Hollands), of which there are above 200, which consume 30,000 lasts of corn annually. It should seem that the manufacture of gin has declined within these few years, for the distillers presented a petition, about two years ago, to the States-General, in which they stated that there was a great decrease in the quantity exported to the United States of North America, in consequence of the establishment of temperance societies in that country. Schiedam has a small harbour, and 352 ships (amounting to 53,547 tons) arrived in 1840, chiefly with cargoes of corn from the Baltic.

SCHIEFER SPAR, *Slate Spar, Foliated Carbonate of Lime*, occurs massive. Structure laminar, the laminæ being thin and generally curved, wavy or undulating. Yields easily to the knife. Colour white, reddish, yellowish, or greenish. Streak white. Lustre pearly on the surface of the laminæ, and vitreous on the edges. Translucent. Specific gravity 2·740. It is almost entirely soluble in acids with effervescence. It occurs in Cornwall, Scotland, and Ireland.

Analysis by—

	Suersen.		R. Phillips.
Carbonate of Lime . .	95·33		98·118
Silica	1·66		00·050
Oxide of Iron . . .	1·00		00·800
Water	2·	Water and loss . .	1·032
	99·99		100·

SCHILLER, FREDERICK, the greatest dramatist and most popular poet of Germany, was born on the 10th of November, 1759, in the town of Marbach, on the banks of the Neckar. He was first sent to school at Ludwigsburg, where, under the celebrated Jahn, he read Ovid, Virgil, and Horace, and also commenced Greek. But he had to follow the changes of residence and life of his parents, which interrupted his studies. This irregularity Carlyle thinks not the most propitious for educating such a boy, but we conceive that its variety was most propitious to the poet, who requires more knowledge of life under its manifold phases, than of books. Schiller had to gather the elements of learning from various masters. 'Perhaps,' says Carlyle, 'it was owing in part to this circumstance that his progress, though respectable, or more, was so little commensurate with what he afterwards became.' But, like most men of genius, we suspect he found the current of life too strong within him,—his heart throbbing with too many active impulses, to attend much to his drier studies, and that 'the stolen charms of ball and leap-frog were frequently bought by reproaches.' There is a poetic anecdote of his being found, while quite a child, during a thunder-storm, 'perched on the branch of a tree, gazing at the tempestuous face of the sky and watching the flashes as in succession they spread their lurid gleam over it; and when reprimanded by his parent, he replied, that the lightning was so very beautiful, he wished to see where it was coming from.' This does not seem like one whose organization fitted him to become the brodgelehrte (mere scholar) whom he afterwards so humorously described. (See his *Essay on Universal History*.) In 1772 he had to prepare for confirmation, and his mother 'having called him out of the street' (where he was playing), to seriously collect his thoughts, he wrote a hymn, which was his first composition, and which led to the opinion of his being adapted for the ecclesiastical order. He welcomed the prospect, and underwent the four annual examinations before the Stuttgard Commission, to which young men designed for the church are subject. But fate decided otherwise. The duke of Würtemburg, having founded a college, gave the sons of his officers a preferable claim to its benefits; he offered them to Schiller's father, who was an army surgeon, and, afraid to refuse the offer, young Schiller accepted it, but with great reluctance, and was, in 1773, enrolled as a student of law. It is indeed worthy of remark, considering how adverse the study of law is to poetry, that so many men of letters should have served a toilsome apprenticeship to it. Schiller, unable to endure its thraldom, exchanged it, in 1775, for the study of medicine, which however he only accepted as less tedious. Apart from his profession he stole cherished hours, which were devoted to Plutarch, Shakspere, Klopstock, Lessing, Göthe, Garve, Herder, Gerstenberg, and others. The 'Messias' of Klopstock and the 'Ugolino' of Gerstenberg were among his earliest and deepest studies, and, combined with his own religious tendencies, had early turned him to sacred poetry. At the age of fourteen he had finished the plan of an epic on Moses, which he subsequently worked up into a dissertation on the 'Legation of Moses.' (See his *Sendung Moses*.) But the popularity of 'Ugolino' and Göthe's 'Göz von Berlichingen,' and the impression which they made on him, inspired him with a dramatic impulse, and he wrote the 'Student of Nassau' and 'Cosmo dei Medici;' some fragments of the latter he preserved and incorporated with the 'Robbers.' Schiller brooded gloomily over his situation. He would often escape in secret to catch a glimpse of the busy world which to him was forbidden; but this only rendered him more averse to school-formalities and class books, so that he would frequently feign sickness, that he might be left in his own chamber to write poetry. In addition to magazine contributions of little value, Schiller worked at his 'Robbers,' and when, in 1780, he graduated, he quoted from it in his thesis (*Ueber den Zuzammenhang der Thierischen Natur des Menschen mit seiner Geistigen*) as from an English work, 'The Life of Moor, Tragedy by Krake, act v., s. 1.' After taking his degree, he was attached as physician to the grenadier battalion, with a small salary. In 1781 he published the 'Robbers,' and in 1782 it was produced, with several entertainments, at Mannheim. The sensation which it excited all over Germany, more than its peculiar merits, calls for a slight notice of it. The outline of the plot is this: The Count von Moor has two sons, Karl and Franz. The younger, jealous of the love which Amalia and the Count bear to Karl, prejudices his father against him by false insinuations, and causes a letter of disinheritance to be written to Karl, who is at Leipzig. Driven to desperation, this young man flies into the forest of Bohemia, and becomes captain of a band of robbers. He afterwards returns in disguise to his father's house,—hears that his betrothed Amalia has become inconstant, and that Franz has not only intercepted all letters of contrition, but has imprisoned their aged father in a tower, with a view to starving him to death. Karl releases the old man, stabs Amalia, and delivers himself up to a poor man with eleven children, that the reward for his apprehension may do good. Franz strangles himself.

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* The name is given differently by different writers.

The situations, the language, the characters, all partake of bombast, occasionally rising to the grand, but seldom escaping from melodrame. A comparison of the first scene with that in 'Lear,' of which it is a direct imitation, will illustrate the crudeness of the whole piece. Whirlwinds, hell, death, and despair are scattered about with exuberant hand. The pistol is to send him, 'alone and companionless, to some burnt and blasted circle of the universe,' where he would have 'eternity for leisure to examine the perplexed image of universal woe.' These two passages from the same soliloquy illustrate the work, which is a mixture of vehement swagger and real grandeur. As acted, it is a ranting, firing melodrame, which could only have had its effect from its vehement contradiction to the cold proprieties of the German-French school, or the more humble melodrame of Lessing. It is said to be 'the most *stimulant* tragedy extant in German literature.' Indeed it pours forth a thunder of rant; it brings impossible characters into violent situations; it is full of exaggerated gigantic metaphors. It has only the excuse of boyhood and boyish enthusiasm uncorrected by experience or knowledge. Schiller himself felt all this in his after-life, and in one of his letters he says, 'To escape from trammels which were a torment to me, my heart fled to an ideal world; but, unacquainted with the real one, from which I was separated by iron bars, ignorant of mankind, and unintroduced to the softer sex, my pencil necessarily missed the middle line between angel and devil, and could produce but moral monsters. . . . Its fault is in presuming to delineate men before I had met one.' The 'Robbers' is only interesting in connection with Schiller and with the history of German literature. The causes of its immense success were various. Respecting the revolution which it created in Germany and (according to public report in France and England) the number of 'young noblemen' which it seduced to brigandage, we may remark that the whole is an exaggeration worthy of the play itself. The intense purpose and passion of the piece produced a wide-spread sensation and many paltry imitations, but no lasting work, no lasting effect. As to the German youth, who all took the road, and the 'German noblemen,' they were about as numerous as the converts to 'Jack Sheppard,' of which so many silly reports have been industriously circulated. On inquiry it turns out that there was only one German nobleman, 'of fairest prospects,' and stricter scrutiny discovers him to have been a German blackguard, 'who took to the highway when he could take to nothing else; not allured by any ebullient enthusiasm, or any misdirected appetite for sublime actions, but driven by the more palpable stimulus of an empty purse.' With the natural feeling of an author, Schiller had ventured 'to go in secret and witness the first representation of the "Robbers" at Mannheim. His incognito did not conceal him, and he was put under arrest during a week for this offence.' Enraged at this and other offences to his dignity as a man, worn out with the prospect of frittering away his energies in his present 'cabbin'd, cribbed, confined' sphere, he resolved to escape, and, taking advantage of the arrival of some foreign duke at Stuttgard, fled from the city, in the month of October, 1782. Dalberg, the director of the Mannheim theatre, received him with open arms, and supplied him with money for his immediate wants. Here he began to look more calmly at his prospects, and, applying himself zealously to work, in the course of a twelvemonth produced his two tragedies 'Fiesco' and 'Kabale und Liebe.'

'Fiesco' still has many admirers. It is melodrame, not tragedy. Yet there is fine dramatic power visible in it. The fierceness and bombast of the 'Robbers' are subdued, though still apparent, and the delineation of characters, though faulty, yet much clearer and truer than in the latter piece. Hassan the Moor is a mere exaggeration, and Fiesco's conduct and language to him equally offensive. But there are still heavier faults. 'The Romance of Julia,' as Fiesco styles his intrigue, develops his subtle character, and affords a stage situation, but during its progress he will not spare his beloved wife the pangs (unnecessary as they are to his purpose) of jealousy. Why does he not hint to her that he but played with Julia? Then again his killing his wife by mistake at the last, is a most clumsy and inartificial contrivance; but it is another death however, the stage has another corpse strewed on it, and this with some is the perfection of tragedy. It is worthy of note that Schiller alters the historical catastrophe, and makes Fiesco fall by the hand of Varrina, the republican, because, as he very truly but rather pompously observes in the preface, the nature of the drama does not admit of the operation of chance or accident; and yet, in spite of this, he makes Fiesco kill his wife by accident. But there are many very justly admired beauties. The couleur locale, as the French call it, that is, that painting of the historic spirit and manner which lies deeper than costume, is well produced. The catastrophe has a most solemn effect. 'The midnight silence of the sleeping city,' says Carlyle, 'interrupted only by the distant sounds of watchmen, by the low hoarse murmur of the sea, or the stealthy footsteps and disguised voice of Fiesco, is conveyed to our imagination by a few brief touches. At length the gun is fired, and the wild uproar which ensues is no less strikingly exhibited.'

'Kabale und Liebe,' with some effective points and 'situations,' is still indifferent, if not bad, and far inferior to 'Fiesco' or the 'Robbers.' It is a household tragedy of the Kotzebue school, extravagantly written, puling with sentimentality, unreal, unpoetic, and unsatisfactory. The question of cabal and love is entirely forced from its import by a want of truth in the delineation. Considered as a drama, its construction is very faulty. What can be more revolting than the situation and feelings between the father and son here? Such pivots should never be admitted but for greater ends and more enlarged interests. What can be more superfluous than the introduction of Lady Milford? What more awkwardly undramatic than the contrivance for giving Wurm's letter an air of truth by making Ferdinand, who up to this period never suspected Louisa, now exclaim, 'You have a lover!' because she refuses to follow him? How much truer and more dramatic to have made him believe there was *some* mysterious bond which restrained her, instead of jumping at once to the foregone conclusion. Finally, the denouement is in the worst possible taste; a reckless attempt to excite our sensibilities; the making Ferdinand kill Louisa and himself out of pure wilfulness, when the whole matter could have been cleared up with a word. Her oath, forced as it was, certainly could not weigh in the scale with the crime of suicide. These three plays all manifestly belong to the same period, and are curious as evidences of the wild enthusiasm of a young poetic spirit.

In 1783 Schiller was appointed theatre-poet, a post of respectability and reasonable profit. He translated Shakspere's 'Macbeth' and some French plays for the theatre, besides his other duties. In 1785 appeared the first number of the 'Thalia,' a miscellany containing essays, criticisms, &c. on the drama, edited by him, which was continued till 1794. In the first number the first three acts of 'Don Carlos' were inserted, which were highly admired. In the 'Thalia' also were published his 'Philosophical Letters.' Having rejected on the one side the arguments of the supernaturalists, and on the other those of the Spinozists, the two parties then at war, he settled into a creed in which faith and reason embrace. His creed is a sort of mystical deism, which is expressed in this one phrase, 'The universe is a thought of God's.' These Letters remain a fragment. They are written with great power, but have little originality.

During the spring of 1785 Schiller migrated into Saxony, and settled near Leipzig. Here he wrote the 'Ode to Joy,' one of his most beautiful creations, and the novel of the 'Ghost-seer,' which was never completed. He then went to Dresden, where he finished 'Don Carlos,' 'the first of his plays which bears the stamp of full maturity.' It is indeed a fine work, though deficient in unity of subject and treatment, which, as he himself remarks, results from his having delayed so long between the first part and the completion of the second. It is the most dramatic of all his plays, and the scenes between Posa and Philip, and between Philip and the Inquisitor, are among the finest specimens of dramatic writing. There is real passion beating through every vein of the work; and its situations are as effective as complex. But Schiller has himself criticised it in his 'Briefe über Don Carlos,' after which little is to be said.

In 1789 Eichhorn retired from the chair of history at Jena, and Göthe recommended Schiller to the place. Here he married Fraülein Lengefeld, and seemed at last comfortably settled. It was here, in addition to his lectures, that he worked at and published his excellent 'History of the Thirty Years' War.' The philosophy of Kant was now producing its revolution in the world of thought, and Schiller embraced it with ardour. His æsthetic essays upon Kantian principles are some of the profoundest and most important speculations on art that we have met with, particularly those on 'Grace and Dignity,' on 'the Pathetic,' on 'the Naïve and Sentimental,' on 'the limits of the Beautiful,' and 'the Letters on Æsthetic culture.'

In 1799 appeared 'Wallenstein.' This vast trilogy, which is his greatest work, and which in truth exhibits greater knowledge, poetic power, and mastery over materials, than his other plays, still appears to be written on a false principle. The drama is not the sphere for pure history. The local colouring is of course necessary in any historical subject, but to make this the dominant element is falsifying the first principle of the drama; yet this is what Göthe and Schiller have done, the former in 'Göz von Berlichingen' and 'Egmont;' the latter in 'Wallenstein' and 'Tell.' The historic truth of the scenes of 'Wallenstein' may be admitted, but their dramatic purpose and power are comparatively small. In 'Carlos' the historic truth was preserved, but not at the expense of the dramatic purpose, and for this reason we have called it the best of his dramas. 'Wallenstein' is so well known through the beautiful translation of Coleridge, that we need make no further comment.

Soon after the publication of 'Wallenstein,' Schiller once more changed his abode. The mountain air of Jena was prejudicial to his lungs, and he determined to go to Weimar, where his acquaintance with Göthe ripened into friendship, and he shared with him the superintendence of the theatre. (See what Göthe says on the valuable exertions of Schiller in the remodelling of plays, in his 'Werke,' b. xxxv.)

In 1800 appeared 'Maria Stuart,' not the most successful effort of his pen, but it contains powerful writing, and is an evidence of increased knowledge of the stage. The vehement and undignified squabble between the two queens is unworthy of the play. The catastrophe is admirable and truly worthy of a queen.

In 1801 was published 'Die Jungfrau von Orleans,' as direct a contrast to 'La Pucelle' as the earnestness and impassioned enthusiasm of Schiller were to the scepticism of Voltaire. As a drama its construction is not so careful. Montgomery is episodical, and the black knight ambiguous. But a great spirit is at work; divine poetry irradiates the scene, and we rise from the perusal under the enchanter's spell. Carlyle has described the Jungfrau as possessing a keen and fervent heart of fire, which the loneliness of her life and her deep religious feelings fanned into a flame. She sits in solitude with her flocks beside the chapel under the antient Druid oak, and visions are revealed to her such as no human eyes beheld. It seems the force of her own spirit expressing its feelings in forms which react upon itself. All this Schiller has delineated in a masterly manner. The piece had unbounded success, and on the night of its representation at Leipzig, when the curtain dropped at the end of the first act, there arose a deafening shout of 'Es lebe Friederich Schiller!' ('Long live Frederick Schiller!'), accompanied by trumpets.

In 1803 he published the 'Braut von Messina,' which was an experiment to see how far a play constructed on antique principles could move a modern audience. It was a failure, although in the preface he argued the point with ability. The plot is simple. A chorus is introduced, which gives occasion to magnificent poetry; but the whole fails to move or interest. It contains parts of as fine writing as any in his works, but the whole experiment was a mistake, which a critic like himself should never have made. The form which poetry seeks for itself in any country or period is suited to that period, but not to another. He thought that if he made the sentiments and subject modern, he could with impunity, or rather with success, clothe them in antient forms.

In 1801, a year after, 'the slight degree of failure or miscalculation,' says Carlyle, 'which occurred in the instance of the 'Bride of Messina,' was abundantly redeemed. 'William Tell' is one of Schiller's very finest dramas; it exhibits some of the highest triumphs which his genius combined with his art ever realized.' (*Life of Schiller*, p. 263.) A. W. Schlegel has also said, 'The last and best of Schiller's works is "Tell." Here he has wholly returned to the poetry of history.' (*Dram. Lect.*, ii. 392.) But the office of the drama is not and cannot be the 'poetry of history;' it is the poetry of passion in action. A drama means an action now doing, not a poetical painting of history. It is on this ground that while revelling in the delicious poetry, the exquisite painting, the truth of character and history exhibited in 'Tell,' we must unreservedly condemn it as a drama. Its merits, such as they are, deserve all admiration, but as a drama it falsifies and abnegates its vital principle, and as a model it is worthless. The vital error is making the historical element, instead of the passionate, the dominant one. But there are still other serious faults of conception and construction. Not to dwell upon the superfluous episodes of Bertha and Rudeny, and of Attinghausen, we have to remark on the error of the conception of Tell himself, the idea of which was furnished by Göthe. Tell is not a patriot, but a simple, sturdy, brave, open, resolute peasant. As a portraiture it is exquisite, but then these two serious consequences result from the conception: first, Tell has nothing intrinsically to do with the revolution of Switzerland; he is not mixed up with its hopes and interests beyond that of any other peasant, and has no more visible share in it than the killing of Gessler; secondly, Tell, not being a patriot, is no more than a murderer. This most serious æsthetic fault is inseparable from the conception. He is wronged by Gessler, and lies in wait for him in a rocky pass, and there shoots him. This is simply murder. In his soliloquy previous to the shot he nowhere indicates an intention of sacrificing the tyrant who oppresses his country and him, but simply his revenge at the man who has subjected him to shoot the apple from his son's head, and whose further hatred he dreads. Had he shot Gessler immediately after having shot at his son, we could have forgiven the excited passion of a father; but he broods over it, and lies in wait for his revenge. Gessler is a mere stage-tyrant, a devil without motive, without glimpse of character. We must observe that in the midst of all this erroneous conception there is some of his finest writing and execution, and that certain points are eminently dramatic: the scene, for instance, where Tell sits in the defile among the rocks of Küssnacht, waiting the approach of his victim, and the unconcern of the every-day travellers with their petty interests, as they pass along, contrasted with the fierce and gloomy purposes of Tell. This was Schiller's last play.

On the 9th May, 1805, after a lingering illness, he felt his end approaching. Of his friends he took a touching but tranquil farewell. Some one inquiring how he felt, he said, 'Calmer and calmer;' simple words expressive of the mild heroism of the man. About six, he sank into a deep sleep; once for a moment he looked up with a lively air, and said, 'Many things were growing clear and plain to him.' And so he died. The great and noble spirit which animated his heart now remains to us in his works, a heirloom to posterity, familiar to every lover of poetry, and worshipped by the whole nation.

In considering his separate works, it will perhaps be thought that we have leaned too much to objection; but we have tried them by the high standard which they demanded; and as for eulogy, they have had more than enough of that. We have endeavoured conscientiously to direct the judgment of the student. A few words in general on his poetical character may not be unimportant.

What distinguished Schiller, and made him the idol of all his nation, was a fine rushing enthusiasm, an exalted love of mankind, and an earnest faith in ideal excellence. Schiller could paint little except himself; but this personality, as in the case of Rousseau and Byron, is one of the causes of his success. All his women are formed from one type. Amalia, Leonora, Louisa, Thekla, Isabella, &c., gentle, loving, affectionate beings, with little individuality, but always surrounded by the halo of a poet's ideal love. The exceptions to this are his meretricious women (Julia, Lady Milford, Princess von Eboli, and Agnes Sorrel are all of one type), and Joanna d'Arc, who is Inspiration personified. His men are either villains, lay figures, or himself. This want of pliancy of imagination is a consequence of his exclusively *subjective* tendency, and he has no comedy for the same reason. On this head we may contrast him with Göthe, whose *objective* tendency enabled him to look out upon nature, and reflect as a mirror the whole universe of things. Schiller was consequently deficient in two essential qualities of a great dramatist, that intellectual faculty which enables the poet to go out of himself, and speak through his characters as they would speak and feel; and the power of selecting a few hints to typify a character, and of avoiding all extraneous matters. Shakspere and Göthe are the two models of dramatic writing in reference to the faculty of lightly touching on every subject without exhausting it. Schiller always exhausts, and hence the length and occasional tediousness of his dialogue; he leaves nothing to the imagination. So with his pathos; he is not pathetic, because he dwells on the minutest points of suffering till our sensibility, unrelieved by the imagination, remains deadened and drowsy. Schiller says of himself that he had not Göthe's manifold richness of ideas, but that his great endeavour was to make as much as possible out of a few. This is in other words admitting his subjective and personal constitution. As a consequence, he is obliged to work out his problems by means of violent contrasts, instead of evolving them from their own bases; thus Posa must be contrasted with Philip; Wurm and the President with Ferdinand; Karl von Moor with Franz; Wallenstein with Octavio; Protestantism with Catholicism in 'Mary Stuart;' Republicans with the Doge in 'Fiesco.' This is the strong use of light and shade by a Rembrandt, rather than the dramatic composition of a Raphael. Schiller's lyrics are the most perfect of his poems, because in them his own feelings only came into play. He has been called the Æschylus of Germany, with that blind designation which, seeing two points of resemblance (both being dramatists, and the most admired of their time), instantly concludes the resemblance of the whole. If compared to any one, it should be to Euripides, whom he resembles in his exhaustive, aphoristic, and rhetorical modes of writing: but he has an intensity and an earnestness which Euripides never had. His verses are in every mouth; his memory is revered; and his works, in spite of their defects, contain the purest spirit of poetry, which the world will not willingly let die.

SCHILLER SPAR occurs crystallized. Primary form an oblique rhombic prism. Cleavage parallel to the lateral planes and both the diagonals. Fracture uneven. Hardness, scratches calcareous spar, is scratched by quartz. Colour olive, blackish, greyish, yellowish-green. Lustre metallic. Nearly opaque; translucent on the edges. Specific gravity 2·692.

When exposed to a strong heat it becomes hard, and forms a mass resembling porcelain.

Found at Baste in the Harz, at Zöbletz in Saxony, in Piedmont, Cornwall, &c. Occurs generally in serpentine.

Analysis of the mineral from Baste by Vauquelin—Silica, 62·00; alumina, 13·00; magnesia, 10·00; lime, 0·00; oxide of iron, 13·00

SCHILLING. [Money.]

SCHIRAS. [Shiras.]

SCHIRVAN. [Shirvan.]

SCHISM, SCHISMATICS. The Greek word *schism* (σχισμα) is used several times in the New Testament in its literal sense of a rent or rupture *in one and the same object* (*Matt.*, ix. 16; xxvii. 51; *Mark*, i. 10; ii. 21; *Luke*, v. 36; xxiii. 45; *John*, xix. 24; xxi. 11); and also in a figurative sense for a division of opinion among a number of persons considered collectively as constituting a whole (*John*, vii. 43; ix. 16; x. 19; *Acts*, xiv. 4; xxiii. 7). In reference to the Christian church, *schism*, in the abstract sense, is never mentioned. *Schisms* are spoken of twice only (1 *Cor.*, i. 10; xi 18); and in a third passage, where the union of the members of the church is compared to that of the parts of the human body, the object of this union is stated to be, 'that there should be no *schism* in the body.' (1 *Cor.*, xii. 24-26.) From a comparison of these passages, it clearly appears that *a schism*, in the New Testament sense, does not imply the *open separation* which exists between Christians and unbelievers, nor that between the members of different Christian communions, but it denotes something existing *within one and the same church*; and further, it does not appear to designate any difference of opinion respecting doctrines or ceremonies or forms of government, but rather to refer to a *state of mind*, to the absence of a spirit of united Christian love. (*Dissent not Schism*, a discourse by T. Binney; Campbell *On the Gospels*, disc. ix., part 3.)

The common use of the word in ecclesiastical writers is different from this. With them *schism* is nearly synonymous with *separation*; but in its stricter use schism is a separation from the communion of a church on the part of certain of its members who do not differ from its other members on any point of religious doctrine. *Heresy* consists in a dissent from the *doctrines* of a church; *schism* is a dissent from its *government*. From this definition it clearly appears that any attempt to enumerate the schisms of the Christian church would be fruitless, since every community is considered schismatical by all the rest.

The event which ecclesiastical historians call *the great Schism of the West* occurred in the fourteenth and fifteenth centuries. After the death of Gregory XI. (A.D. 1378), the cardinals, being compelled by the clamour of the people of Rome to elect an Italian to the popedom, chose Urban VI.; but afterwards the leading members of the college retired to Fondi in Naples, and elected Clement VII., who set up his court at Avignon, while Urban remained at Rome. Clement was recognised as pope by France, Spain, Scotland, Sicily, and Cyprus, and Urban by the rest of Europe. This schism continued till the year 1417, when it was healed by the Council of Constance, which elected Martin V. to the papacy. (Mosheim's *Ecclesiastical History*, cent. xiv., pt. ii., c. ii., sect. 14, &c.; Waddington's *Church History*, c. xxiii.)

The other great schism is that between the Greek and Latin churches. [Greek Church.]

SCHISMA (from *σχίσμα, cleft, division*), an interval, used only in mathematico musical calculations, equal to half a comma. [Comma.]

SCHIZANDRA (from σχίζω and ἀνήρ), a genus of plants belonging to the natural order Anonaceæ. The flowers are monœcious; sepals 9; no petals; the male flowers having 5 anthers, which are joined at the apex; female ones with an indefinite number of ovaries; berries arranged in spikes along an elongated receptacle. This genus with two others have been made by Blume into a natural order called Schizandreæ. They form a natural group, which are distinguished from Anonaceæ by their toothed leaves, the less constant number of their floral envelopes, their usually combined stamens, and their even, not ruminated, albumen.

S. coccinea, the Scarlet Schizandra, is one of our most beautiful greenhouse climbers. It has alternate, oval-lanceolate leaves, pointed at both ends, rarely toothed, of a beautiful green, smooth above, and pale beneath; scarlet flowers disposed in spikes in the axils of the leaves. It is a North American plant, and is found in woods in Georgia, Florida, and Carolina. It is easily propagated by cuttings, and grows best in a light sandy soil.

SCHIZODESMA, Mr. Gray's name for a genus composed of those *Mactræ* which have the ligament placed in an external slit.

SCHIZO'PODA, M. Latreille's name for a division of Macrurous Crustaceans, or Cleft-footed *Malacostraca*, consisting of the genera *Nebalia* and *Mysis* (*Opossum Shrimps*). These last form probably the only genus of the division; for it is the opinion of Mr. J. V. Thompson and other zoologists that *Nebalia* is most probably a crustaceous animal in its progress to a more perfect state. [Stomapodes.]

SCHLEGEL, JOHANN ELIAS, was the eldest of three brothers, all of whom distinguished themselves by their literary exertions, and acquired some celebrity for a name which has since been rendered more illustrious by two writers (also brothers), August Wilhelm and Friedrich von Schlegel. Johann Elias was born at Meissen, where his father was 'appellations-rath,' Jan. 28th, 1718. At the age of twelve he began to display a taste not only for reading but composing poetry; and was greatly encouraged in his studies by his father, who was himself a man of superior capacity and of a very literary turn. While he was at the university of Leipzig, his talents recommended him to Gottsched, then looked up to as the arbiter in matters of poetical taste, to whose 'Kritischen Beiträgen,' &c. he contributed several pieces, as he did also to the miscellany entitled 'Belustigungen des Verstandes,' &c., besides writing various dramatic compositions. Neither did he neglect his severer academical studies, but on the contrary applied to them with great diligence; as he did likewise to French, English, and Italian literature. On quitting Leipzig, he accompanied Von Spener (who had married his uncle's widow) to Copenhagen as his secretary, the latter being sent as envoy to the court of Denmark. All his leisure from his official employments he now devoted not only to studying the language thoroughly, but to making himself acquainted with the history and condition of the country, both by reading and conversation. The information he thus collected, together with his own remarks, he gave to the public in the form of a weekly periodical, entitled 'Der Fremde,' which obtained for him considerable notice. He afterwards became acquainted with Holberg, who procured him the professorship of modern history and the appointment of librarian at the academy of Soroe, founded by himself. [Holberg.] But his excessive application to his duties and to his private studies proved too much for his constitution, which was not a very strong one, and in the course of the following year he was carried off by a fever, Aug. 13th, 1749, at the age of thirty-one. A complete edition of his works, in 5 vols., was published by his brother Johann Heinrich, 1761-70.

Johann Adolphus, the second brother, born at Meissen, Sept. 18th, 1721, studied at Leipzig with Elias, and, like him, then began to make himself known in the literary world by his contributions to the two publications above mentioned. For a time he bestowed far more attention on merely literary pursuits than on the studies more immediately connected with his future profession; but if he did not distinguish himself by profound theological learning, he acquired very great popularity as a preacher, both by the style of his sermons and by his emphatic and animated delivery. At Zerbst, where he was pastor primarius, and professor of theology and metaphysics, from 1754 to 1759, he was frequently called upon to preach before the court. Of his pulpit compositions, several collections appeared at different times, the earliest being that in three volumes, 1754-58. As a poet he must be estimated rather according to the standard of his own day than that of the present. He may rank among those who exerted themselves to introduce a better taste; and his odes, and religious and moral pieces, though by no means free from defects, abound with fine passages. He survived both his brothers many years, not dying till Sept. 16th, 1793.

Johann Heinrich, born in 1724, studied, like his brothers, at Leipzig, and, through the influence of Elias, obtained an appointment as secretary in the chancery at Copenhagen. He afterwards became professor of history at the university there, and Danish historiographer royal; and died in that capital, October 18th, 1780. Although not so distinguished as either of the preceding, he was a writer of some ability, and published a history of the sovereigns of Denmark of the house of Oldenburg, and several other works relative to that country. He also translated Thomson's 'Sophonisba' and some other tragedies from the English.

SCHLEGEL, FRIEDRICH VON, was born at Hanover on the 10th of March, 1772. His father, Johann Adolph Schlegel, was brother of Johann Elias and Johann Heinrich Schlegel, and all these, together with August Wilhelm von Schlegel, who is still alive, are illustrious names in the literature of Germany. Frederic Schlegel received a very liberal education, although his father wished him to engage in mercantile pursuits. Accordingly he was placed as apprentice in a mercantile house at Leipzig, but he showed so little inclination and ability for the business, that the father sent him to Göttingen to study philology, though in the course of his education he had not shown any promising talents. After a year's residence in this place, Schlegel went to Leipzig, where he continued his studies with such zeal, that on leaving the university he had read all the more important antient writers in the original language. His first publication of any importance was 'Griechen und Römer,' Hamb., 1797, of which his 'Geschichte der Griechen und Römer,' Berlin, 1798, may be considered as a continuation. This was only a fragment, and it has never been completed. At this time all his thoughts seem to have been absorbed by antient literature, with which, as his early works show, he had formed a most intimate acquaintance. About the same time he undertook, together with Schleiermacher, to translate Plato into German; but after the first sheets were printed, he abandoned the undertaking, and left the whole in the hands of Schleiermacher. In 1796 he began editing, with his brother August Wilhelm, a literary periodical, called the 'Athenæum,' of which however only three vols. appeared. The object of this publication was to produce an entire change in the literature of Germany. It was of a polemical character, and directed against the most popular authors of the time, especially Kotzebue and Iffland. The papers which it contained were very valuable, but written in an arrogant and contemptuous tone. Another work, with the same object, was 'Kritiken und Charakteristiken,' which he likewise edited with his brother. In 1799 Schlegel published at Berlin the first volume of a novel called 'Lucinde,' which created a great sensation. It was admired and commended by men of the highest eminence, such as Schleiermacher, while it was most severely censured by others, who saw in it nothing but an exaltation of sensual pleasure. The justice of the censure appears to have been felt by Schlegel himself, for he never completed the work. In the year 1800 he left Berlin and went to Jena, where he delivered a course of lectures on philosophy, which were received with great applause. In 1802 he published at Berlin a tragedy called 'Alarkas,' grand in its conception, but romantic and rather mystic in its whole character. In the same year he travelled with his wife, the daughter of the celebrated M. Mendelsohn, to Paris, where he delivered lectures on philosophy, and edited a monthly periodical called 'Europa,' of which only two volumes appeared (Frankfort, 1803-5). At Paris he also studied the arts, the languages of Southern Europe, and more especially the language and literature of the antient Indians. The fruits of the latter study appeared in his little essay, 'Ueber die Sprache und Weisheit der Indier,' Berlin, 1808, one of the first works which appeared in Germany on the literature of India: it had great defects, and among others it contained the usual exaggerated notions respecting the civilization of the Indians. The results of his other studies at Paris may be seen in his 'Geschichte der Jungfrau von Orleans,' Berlin, 1802; 'Sammlung romantischer Dichtungen des Mittelalters,' Berlin, 1804; and 'Lother und Maller,' Berlin, 1805. After his return to Germany he published a collection of his poems, Berlin, 1809, which are partly of a dithyrambic and partly of an elegiac character. All these works, as well as his 'Poetisches Taschenbuch,' Berlin, 1806, and his epic poem 'Roland,' show the author's deep veneration for the arts, the poetry, and the whole social life of the middle ages. This feeling had taken strong hold of him, as appeared more manifestly from his wife and himself embracing the Roman Catholic religion at Cologne in 1801. He now went to Vienna, where, in 1809, he was appointed imperial secretary at the head-quarters of the archduke Charles, and in this capacity he exercised a great and beneficial influence upon the national spirit of the Germans by his inspiring proclamations. After the political wreck of Austria he returned to his literary occupations, and delivered a course of lectures on modern history ('Ueber die neuere Geschichte,' published at Vienna, 1811), and on the history of antient and modern literature ('Ueber die Geschichte der alten und neuen Literatur,' published at Vienna, 1815, in two vols.). The latter work has been translated into English. In the years 1812 and 1813 he edited the 'Deutsche Museum,' of which only two volumes appeared. Schlegel also tried his strength as a politician and diplomatist, and his writings on subjects of this kind were so highly valued by Prince Metternich, that he appointed him councillor of legation to the Austrian embassy at the German diet at Frankfort. But he resigned this office in 1818, and returned to Vienna, where he began to edit a new periodical called 'Concordia,' Vienna, 1820-21, with a view of reconciling the various opinions respecting church and state. About this time he also began to prepare a complete edition of his scattered works, which was published in twelve vols., Vienna, 1822, &c. In 1827 he delivered a course of lectures on practical philosophy ('Philosophie des Lebens,' published at Vienna, 1828), and in 1828 another course on the philosophy of history ('Philosophie der Geschichte,' Vienna, 1829, 2 vols.). Towards the close of this year Schlegel made a journey to Dresden, with a view to deliver a series of lectures, but while he was working them out, he died on the 12th of January, 1829. The Dresden lectures, as far as they were finished, were published in 1830 at Vienna, under the title of 'Philosophische Vorlesungen, insbesondere über die Philosophie der Sprache und des Wortes.' His friend Professor Windischmann of Bonn undertook the editorship of such works as were left in MS., and the first vol. appeared at Bonn in 1836, under the title of 'Philosophische Vorlesungen aus den Jahren 1804-6, nebst Fragmenten, vorzüglich Philosophisch-theologischen Inhalts.' But the death of Windischmann has prevented the completion of this collection.

Frederic von Schlegel, together with Tieck and Novalis, were, at the end of the last and the commencement of the present century, at the head of a literary revolution in Germany, which endeavoured to promulgate its principles in the two works above mentioned, the 'Athenæum' and 'Kritiken and Charakteristiken.' The new school which these writers endeavoured to establish is characterised by the name of the *Aesthetico-critical*, or that of the *romantic* school of poetry. The predilection for the middle ages and Roman Catholicism was common to all of them, but in none of them so strong as in Frederic von Schlegel, who would gladly have restored the middle ages, with their arts, their literature, and their religion. This tendency, and the great names by which it was supported, led to very injurious consequences; but some writers of this school have produced poems which will live as long as the German language, and to their exertions we are indebted for a more correct knowledge of the nature of romantic poetry, and its relation to the antique or classical poetry. These writers also established the fact, that the middle ages, though generally looked upon with contempt, were not all darkness. But whatever may be the errors into which Schlegel was led by his peculiar turn of mind, no one has ever accused him of insincerity. It has indeed sometimes been said that he should not have lent himself as an agent to the Austrian government. Now it is true that he did so, but this should not be made a particular charge against him, as it was a natural consequence of his general views and principles. The poetical works of Frederic von Schlegel are of less value than his critical and philosophical writings, which are distinguished by acuteness, profundity of thought, and great learning. His style however is not always as clear and lucid as that of many of his contemporaries. There are some very good remarks on Frederic von Schlegel in Mrs. Austin's 'Characteristics of Göthe,' vol. i., p. 298, &c., and in Carlyle's 'Miscellanies,' xii., p. 274, &c.

SCHLEIERMACHER, FRIEDRICH ERNST DANIEL, was born on the 21st of November, 1768, at Breslau. His parents belonged to the religious sect called Moravians, and the son accordingly received his first instructions in the educational establishment of that body at Niesky. He began his theological studies at Barby, where the Moravians possess a seminary for young theologians. But when he was eighteen years old he left this sect, and began a fresh course of study in the university of Halle, where he devoted himself with no less zeal to the study of philology than to theology, though the latter department was that to which he intended to devote his life, for he was thoroughly convinced that theological studies cannot be pursued with advantage without a knowledge of antiquity and its literature. In 1790, when he had finished his studies, he undertook the education of the children of Count Dohna-Schlobitten, who lived at Finkenstein in Prussia. He did not however remain long in this situation as private tutor, but went to Berlin, and was for some time engaged as teacher in the seminary for teachers, which was then conducted by Gedike. In 1794 he was appointed assistant preacher at Landsberg on the Warthe, but two years after he returned to Berlin, where he was engaged as preacher to the great hospital called the 'Charité,' until the year 1802. Here he became acquainted with the celebrated theologian F. S. G. Sack, who was then engaged in translating Blair's 'Sermons' into German (Leipzig, 1781-1800, 5 vols.). Schleiermacher took an active part in this undertaking, and the greater part of the last volume was translated by him alone. On the suggestion of Sack he also translated Fawcett's 'Sermons,' Berlin, 1798, 2 vols. The first original works of Schleiermacher were some essays in the 'Athenæum,' which was edited by the Schlegels. [SCHLEGEL, F. VON.] Among the papers which he contributed to this publication were his 'Vertraute Briefe über die Lucinde' ('Confidential Letters on the Lucinde'), a novel of Fr. von Schlegel.) They were published without the author's name, and bestowed the highest commendation on the novel, though it seems to be clear that Schleiermacher was not aware of the dangerous principles that lay at the bottom of the work which he praised. Soon after the death of Schleiermacher these letters were republished by Carl Gutzkow (Hamburg, 1835), one of the writers of the school called Young Germany, with the malignant intention of vilifying the noble character of their author, and of drawing censure upon him for long-forgotten youthful aberrations. This publication at first created a very great sensation, but the voice of Germany rose against the unworthy conduct of Gutzkow, and the work has since fallen into well deserved oblivion. In 1799 Schleiermacher published his 'Discourses on Religion' ('Reden über die Religion, an die Gebildeten unter ihren Verächtern'), a third edition of which appeared in 1821, with notes. These discourses contain some of the finest specimens of German oratory, are full of profound thoughts, and more calculated than any other work to convince the educated classes of society of the necessity of religion. In 1800 he published a work called 'Monologen, eine Neujahrsgabe' (a fourth edition of which appeared at Berlin in 1829), and 'Briefe eines Predigers ausserhalb Berlin.' The last of these two little works was a reply to a public letter (Sendschreiben) addressed by some Jews to the Protestant theologian W. A. Teller. About this time Schleiermacher conceived the plan of translating with Fr. Schlegel the works of Plato, and when Schlegel abandoned the undertaking, Schleiermacher continued it by himself. This translation, which however unfortunately does not comprehend all the works of Plato, appeared at intervals, from 1804 to 1828, and consists of 3 vols., in 6 parts. A second edition of the first 5 parts appeared at Berlin from 1817 till 1827. This translation of Plato is the most correct and most beautiful that has ever been published in any European language. Each of the dialogues is moreover preceded by a most valuable introduction, in which the author develops the spirit and principle of the dialogue. These introductions, some of which have been translated into English, show that Schleiermacher was most deeply acquainted with the spirit of the Platonic philosophy. In 1801 he published his first collection of sermons, a third edition of which appeared in 1816. This collection of sermons was in subsequent years followed by six other collections, which were published between the years 1808 and 1833. Of the second, third, and fourth collections, second editions appeared in 1816-1826. All these collections together make seven small octavo volumes. Besides these collections Schleiermacher published a great number of single sermons delivered on particular occasions. All the sermons of Schleiermacher are distinguished for a clearness and perspicuity of style and thought such as are seldom found in any modern writer of sermons. Their prevailing characteristics are, that they address themselves more to the understanding of his hearers than to their feelings or imagination, whence Schleiermacher and his followers have been designated by the name of the 'Denkglaübigen,' in contradistinction from the 'Wort-' or 'Altglaübigen,' and the mystical Pietists. In 1802 Schleiermacher went to Stolpe with the title of court preacher, and here he wrote an admirable work called 'Grundlinien einer Kritik der bisherigen Sittenlehre,' Berlin, 1803, a second edition of which appeared in 1834, and another called 'Zwei unvorgreifliche Gutachten in Sachen des Protestantischen Kirchenwesens,' Berlin, 1803. The latter work appeared without the author's name. He had not been long at Stolpe when he received an invitation to a professorship in the university of Würzburg, but he declined the offer at the request of the Prussian government, which in return appointed him professor of theology and philosophy in the university of Halle (1802). After the political catastrophe of 1806, when Halle was made a part of the new kingdom of Westphalia, Schleiermacher went back to Berlin, where he began to deliver public lectures on theological and philosophical subjects. During this period of the political humiliation of Prussia, Schleiermacher showed himself a true patriot, and in the pulpit, as well as on other occasions, he fearlessly endeavoured to rouse the spirit of his hearers against the foreign oppressors. During this period he wrote the following little works:—'Die Weihnachtsfeier, ein Gespräch,' Halle, 1806, 2nd edition, Berlin, 1827; 'Ueber den sogenannten ersten Brief des Paulus an den Timotheus,' Berlin, 1807; 'Gelegentliche Gedanken über Universitäten im Deutschen Sinne,' Berlin, 1808; and an essay on Heraclitus, which appeared in F. A. Wolf's 'Museum der Alterthumswissenschaften.' In 1809 Schleiermacher was appointed preacher at Trinity Church in Berlin; and in 1810, when the new university of that capital was opened, he was appointed professor of theology, and at the same time he began to take an active part in the business of the ministry for public instruction. His lectures in the university gained for him universal admiration, for here he combined with the great oratorical powers which he had already displayed in the pulpit, the most profound thought and the most extensive learning; here he had an opportunity of unfolding all the treasures of his great mind, and he followed out the most abstruse investigations into their minutest details with luminous order and distinctness. In 1811 he was created a member of the Academy of Sciences at Berlin, and furnished some of the best papers on various subjects, but especially on particular points of the history of antient philosophy. They are published in the 'Transactions' of the Academy. In 1811 Schleiermacher published 'Kurze Darstellung des Theologischen Studiums.' In 1814 he was made secretary to the philosophical section of the Academy, and on this account he was released from his duties in the ministry for public instruction. During the period which now followed, Schleiermacher was partly engaged in new editions of former works, or their continuations, and partly in publishing a number of smaller polemical writings, especially against F. A. H. Schmalz and C. F. von Ammon. Among the greater works which he wrote during the last period of his life we shall mention 'Ueber die Schriften des Lukas, ein Kritischer Versuch,' Leipzig, 1817, which was translated into English in 1825, and 'Der Christliche Glaube, nach den Grundsätzen der Evangelischen Kirche im Zusammenhange dargestellt,' Berlin, 1821-22, 2 vols., a second edition of which appeared in 1830. In the autumn of the year 1833 Schleiermacher visited England, and opened the new German chapel at the Savoy. He died on the 12th of February, 1834. A most moving account of the death of this great man was sent over to England, and published in the 'Journal of Education,' No. XX. The whole of the works of Schleiermacher have been collected and published since his death (1835, &c.), in three sections. The first section (called 'Zur Theologie') contains, in four volumes, those theological works which are of a scientific character; the second (also called 'Zur Theologie') contains his sermons, in four volumes; the third (called 'Zur Philosophie') contains his philosophical works, in five volumes. The works which Schleiermacher left in MS. were edited by Zabel, Berlin, 1835, 2 vols. 8vo.

Schleiermacher was equally great as a theologian, a philologer, a critic, an orator, and a translator; and the influence which his writings had on the intellectual part of Germany was and is still exceedingly great, but it was far surpassed by that which his oral instruction, and the purity, piety, and sanctity of his personal character exercised over those who had the happiness to live near him. Our space does not allow us to enter into an examination of his theological system, which is most amply explained in his 'Der Christliche Glaube.' It may be sufficient here to state, that he neither belonged to the old superstitious and word-splitting school, nor to the modern Pietists or Rationalists.

(Compare Lücke; 'Erinnerungen an Dr. Fr. Schleiermacher,' in the theological journal called 'Theologische Studien,' for 1834; and Mrs. Austin, 'Fragments from German Prose Writers,' p. 336, &c.)

SCHLESWIG, sometimes called South Jutland, is a duchy belonging to the crown of Denmark, situated between 54° 20′ and 55° 20′ N. lat. and between 8° 40′ and 10° 5′ E long. It is bounded on the north by Jutland, on the east by the Little Belt, on the south by Holstein, from which it is divided by the river Eider and the Kiel Canal, and on the west by the German Ocean. The area is 3450 square miles. It is in general a level country. A range of low hills enters it from Holstein, and, traversing it from south to north, passes into Jutland. The length, from north to south, is about 70 miles, and the breadth, from east to west, varies from 30 to 56 miles, not including the islands on the east and west coasts. On the west coast there are low and rich marsh lands, which are protected by dykes, twenty feet high, against the spring tides, which often rise to the height of thirteen feet. As the sea in many places deposits alluvium, new dykes are erected from time to time, to secure these additions. The principal rivers are the Eider, the Widau, and the Aue. The east coast is not so low as the west coast, but it is equally fertile. The climate is on the whole temperate and healthy, but damper and less salubrious on the west than on the east coast. The country produces corn, pulse, flax, hemp, rape-seed, hay, clover, garden vegetables, and potatoes. The breed of horned cattle and that of horses are excellent. The country in short produces much more than is required for its own consumption, and exports annually 150,000 lasts of corn, great numbers of oxen, above 3000 horses, and large quantities of butter and cheese. Fish too are an important article of exportation. Wood is scarce, both for building and fuel. There are limestone, chalk, slate, and turf, but no metallic minerals. The chief occupations of the inhabitants are agriculture, the breeding of cattle, and the fisheries. There are no manufactories except in the large towns, and these are of little importance. The most considerable are those of lace and stockings, in Tondern, Hüsum, Friederichstadt, and some other places. The inhabitants, who profess the Protestant religion, are partly of German, partly of Danish or Frisian descent. According to Stein, in his 'Gazetteer,' published in 1821, there were, in 1817, 300,000: of whom 55,000 spoke German; 42,000, on the west coast, a very corrupt Frisian dialect; 15,000, on the east coast, the language of the Angles; and 176,000 Danish. The present population may be 340,000 (it was 338,000 in 1835) on the mainland, and 40,000 in the islands.

The islands on the east coast are **Arroe**, **Föhr** (which have already been described), and Femern, which is separated from the north-east point of Holstein by a narrow channel, the Femersund, it is about 16 miles long and 12 broad, the area 63 square miles, and the population 8200. This island produces abundance of wheat, barley, and peas. The inhabitants manufacture large quantities of barley-groats and peeled barley for exportation; they likewise export annually 20,000 pairs of worsted stockings to Mecklenburg. The fisheries are very productive, and the islanders have about 40 vessels at sea, from 12 to 56 tons burden. There is a lighthouse, 100 feet high, on the island. The chief town is Burg, or Borg, which has 1700 inhabitants. On the west coast are Romöe, or Röm, of which only the southern part belongs to Schleswig, and the northern to Jutland: Sylt, 20 miles long, 15 broad, has 4000 inhabitants; most of the men are sailors and fishermen; the business of agriculture is chiefly performed by the women, who also manufacture worsted stockings. Nordstrand was a large island, which was visited by a dreadful inundation on the 11th of October, 1634, when 6408 persons and 50,000 head of cattle perished, and the island was broken into fragments, of which only two, Nordstrand and Pellworm, have been secured by dykes. The inhabitants have a fine breed of cattle. These islands are the resort of seals and water-fowl. Many thousands of these water-fowl are annually taken, boiled in vinegar, and packed in barrels for exportation. Between these larger islands there are many small ones, without dykes, the construction of which would be too expensive. They are inhabited by descendants of the Frieslanders, whose language they still speak, and who, during the inundations, have their abode on the tumuli called Warfen, which were thrown up in remote ages, and on which the churches are built.

Schleswig, the chief town of the duchy, is situated in 54° 30′ N. lat. and 9° 35′ E. long., in a pleasant country at the mouth of the river Sley, which forms a small shallow bay obstructed by sand-banks. It is a long irregularly built town; the houses are mostly of brick, and resemble in neatness those of a Dutch town. The principal public buildings are the churches, of which the cathedral deserves notice on account of a screen before the altar, admirably carved in wood by Hans Brüggemann in 1521; the town-house, the orphan asylum, the poor-house, and the nunnery of St. John. Among the numerous public institutions are the cathedral school, the Bible Society for the duchies, and the deaf and dumb asylum, in which there is a printing-office with six presses, where Bibles and New Testaments are printed. The population is 11,000. There are manufactures of china, earthenware, lace, cambrics, thread, leather, sailcloth, woollens, starch, and refined sugar. On an island in the bay is the castle of Gottorp, formerly the residence of the dukes of Schleswig-Holstein, and now of the prince, who is governor of the duchies of Schleswig and Holstein.

The mouth of the Sley having been rendered navigable by means of a canal, the navigation is considerable.

Besides **Apenrade** and **Flensburg**, the following are the most considerable towns in the duchy:—Eckernforde, with 3500 inhabitants, has a good harbour, and a trade in corn with England; Friedrichstadt on the Eider, a well-built town, founded by Dutch settlers, has 3000 inhabitants, who have manufactures of silk, cotton, hosiery, starch, and lackered wares. Hüsum, on the Aue, with 4500 inhabitants, has a grammar-school, distilleries of brandy from potatoes, breweries, manufactures of leather and tobacco, and a considerable trade in corn and cattle. Tondern or Tundern, on the river Widau, has 3600 inhabitants. It has a good port, with a trade in corn and cattle, an oyster-fishery, and manufactures of cotton and lace; the last employs, in the town and the environs several miles round, 10,000 or 12,000 persons. Tönningen, a seaport and trading town at the mouth of the Eider, has 2200 inhabitants.

(Stein; Hassel; Cannabich; *Conversations Lexicon.*)

SHLÖZER, AUGUST LUDWIG VON, was born on the 5th of July, 1737, at Jagstadt on the Jaxt, in the principality of Hohenlohe-Kirchberg. His father died very early, but the boy received a good education, and in 1751 was sent to the university of Wittemberg to study theology. Here he conceived a most ardent wish to travel into Asia, and for this purpose he began the study of Oriental languages. In 1754 he went to Göttingen, where he continued the study of theology for two years, at the end of which time he engaged himself as tutor to a Swedish family, with whom he went to Sweden. He spent three years and a half partly at Stockholm and partly at Upsala. Although theology had been his principal study, he opened his literary career with a 'History of Commerce,' in Swedish ('Versuch einer Handelsgeschichte,' Stockholm, 1758), and history henceforth remained his favourite pursuit. In 1759 he returned to Göttingen, and now began seriously to prepare himself for his journey to Asia by intense application to the Eastern languages and to the study of medicine. But in 176 Müller, the historiographer of the Russian empire, offered him the place of tutor to his family, and of a literary assistant in his own pursuits, at the same time holding out to Schlözer the hope of obtaining a professorship in the academy of Petersburg, and the support of the government for his intended journey. These hopes induced Schlözer to accept the offer. On his arrival in Petersburg he immediately began to study the Russian language and the history of the empire; but his great progress provoked the jealousy of his principal, and rendered the situation of Schlözer very unpleasant. In 1762 Schlözer was made adjunctus to the academy and teacher in a public establishment, which induced him to quit his place in the house of Müller, who now became his avowed opponent. Michaelis of Göttingen, in the meanwhile, had not forgotten his young friend, and it was through his influence that in 1764 a professorship the university of Göttingen was offered to him. Schlözer would have gladly accepted it, but his adversary contrived to induce the Russian government to refuse him permission to leave the country. After many negotiations he was however, in 1765, appointed professor of Russian history to the academy of Petersburg, and he also obtained leave of absence for three months to visit his native country. He returned to Petersburg, but only remained there two years longer, after which, in 1767, he was invited the university of Göttingen, as professor of political science. Here he commenced a new and very active life, and wrote several historical works, some of which still rank among the best in the German language. His style is interesting but sometimes rather coarse and without taste. His lectures on history, political science, statistics, and other subjects were heard with great admiration. At the age of seventy he withdrew from his office; in 1804 he was raised by the emperor of Russia to the rank of a nobleman and received the title of privy councillor of justice. He died on the 9th September, 1809. His Life has been written by his Christian von Schlözer, under the title of 'A. L. von Schlözer's Oeffentliches und Privatleben, aus Originalurkunden' Leipzig, 1828, 2 vols. 8vo.

The works of Schlözer are partly historical and partly political. Among the former are, a 'General History the North' ('Allgemeine Nordische Geschichte,' Halle, 1772, 2 vols. 8vo.); a German translation of Nestor's 'Chronicle' down to the year 980, Göttingen, 1802-9; 'Weltgeschichte im Auszug und Zusammenhange,' Göttingen, 1792-1801, 2 vols. 8vo.; 'Vorbereitung zur Weltgeschichte für Kinder,' a fifth edition of which appeared at Göttingen, 1800. As a political writer Schlözer had great influence in Germany. His views are laid down in his correspondence ('Briefwechsel') which he published at Göttingen, 1776-1782, in 10 vols. 8vo., and in a political journal called 'Staatsanzeigen,' which he edited from 1782 till 1793, 18 vols. The main object of this last publication was expose the evils and abuses in the administration of the various states of Germany.

SCHLÜSSELBURG, the capital of a district of the same name in the government of St. Petersburg, is situated on the left bank of the Neva, at the spot where that river issues from Lake Ladoga: the fortress is on Catherine Island, at the entrance of the river, and its guns command both banks. The town was founded by the Russian grand-duke George Danielowitsch, in 1324, but afterwards taken by the Swedes. In the sequel it frequently changed masters, till Peter the Great finally conquered it in 1702. Since this country has ceased to be the theatre of war, the fortress has often been used as a state prison. The population is 3000. They have a manufactory of printed calicos, and also of porcelain. There is a brisk trade on the Neva and Lake Ladoga, 3000 barks and 1000 rafts annually passing this town to Petersburg. The fishery on the lake is very productive.

(Stein, *Geographisches Lexicon*; Schnitzler, *La Russie, la Pologne, et la Finlande*.)

SCHMALKALDEN. [FULDA.]

SCHMALKALDEN LEAGUE. [LUTHER; REFORMATION.]

SCHNEEBERG is a mining town in the circle of the Erzgebirge, in the kingdom of Saxony, situated in 50° 18′ N. lat. and 12° 30′ E. long. It stands on a mountain called the Schneeberg, about a league from the river Mulde, from which there is a canal, on which timber is floated to Schneeberg. The town is said to have been built in 1471, when some new and very rich veins were discovered in the silver-mines that had been worked for a long period. One vein, called the Georgenzeche, was particularly rich, but great doubts are entertained of the correctness of a tradition that on the 23rd of April, 1477, duke Albrecht with his councillors dined in this mine, when a block of silver ore served as the table, which when melted yielded 400 cwt. of silver. It is however certain that the produce of the Schneeberg mines was so great that a share cost 5000 dollars. In the sequel these mines became much less productive; as a compensation for their loss the attention of the people was devoted to cobalt, the art of manufacturing smalt having been discovered, as it seems, at the beginning of the sixteenth century by Peter Weidenhammer, and perfected between 1540 and 1560, by Schurer, a Bohemian glass-manufacturer. At present cobalt and silver are the chief products of these mines. Bismuth, lead, tin, and iron are likewise found in the neighbourhood. Schneeberg is a very well built town; the principal church, the handsomest in the Erzgebirge, and the largest in Saxony, is adorned with paintings by Lucas Kranach. Among the public institutions are a gymnasium, several schools, in some of which lace-weaving is taught, a Sunday-school for young mechanics, an orphan asylum, and an hospital. The inhabitants, now about 7000, besides those in the mines, manufacture bone lace, blond, gold and silver lace, morocco paper, and lackered wares. There are also manufactures of chemicals and beer breweries. Schneeberg is the seat of a mining court, and the depository of the produce of the royal smalt-works at Oberschlema. The smalt is chiefly exported to England and Holland, and frequently to China. Engelhardt says that the value of the smalt annually produced is from 300,000 to 400,000 dollars.

(Hassel; Stein; Cannabich; Engelhardt; *Sachsen*, seventh edition, by Schlieben. 1835.)

SCHNEIDER, CONRAD VICTOR, was born at Bitterfield in Saxony, in 1610, and died in 1680 at Würtemberg, where he had been for many years professor of medicine and physician to the elector. He appears to have been a very learned man, and to have possessed much skill and industry in forming compilations from the writings of other physicians. His works are very numerous: the most important is that entitled 'De Catarrhis' (Witteb., 1660), which consists of six books, devoted chiefly to an anatomical description of the cavities of the nose, and to the refutation of the antient and generally received opinion that the mucus in a catarrh flows from the brain through apertures in the ethmoid bone into the nose and to the fauces. In this refutation it may be easily believed that he was successful; for the most superficial examination of the parts is sufficient to prove that such a passage of fluid is impossible, and that there are no holes in the skull which are not accurately closed by membranes, nerves, &c. In Schneider's time however the general reception of a different opinion must have rendered some intellectual energy necessary for the establishment of even so obvious a fact as this; and he has therefore been justly rewarded by the name of Schneiderian membrane having been since appropriated to that lining of the cavities of the nose of which he was the first to describe the structure and some of the functions.

SCHNEIDER, JOHANN GOTTLIEB, was born on the 18th of January, 1750, in the village of Kolm, near Wurzen in Saxony, from which circumstance, in the title-page of all his works, he added to his name the epithet of 'Saxo.' His father was a poor village mason, and could do nothing for the education of his son. At the age of four years the boy was received into the house of an uncle, who was in better circumstances, and afterwards sent him to the public school of Schul-Pforte. Here he was subjected to a stricter discipline than he had hitherto been accustomed to, and his unwillingness to submit to it nearly brought upon him the disgrace of being sent away. The threat however roused his energies and ambition, and from this moment he began with the most unwearied diligence to study the antient languages, which then formed the only subjects of instruction in that establishment. At the age of eighteen, his uncle sent him to the university of Leipzig to study law. But the acquaintance which he here formed with some of the most eminent philologists, induced him to resume the study of antient literature, which he had so successfully commenced at school. His first work, 'Anmerkungen über den Anacreon,' Leipzig, was published in 1770, and in the following year appeared the 'Periculum Criticum in Anthologiam Constantini Cephalae.' To the latter work was added a series of emendations of the text of Aristotle's 'Natural History,' which from this time became his favourite study. In the same year Schneider left Leipzig for Göttingen; but as his uncle either would not or could not any longer supply him with money, he lived for several years in the greatest poverty, and gladly accepted the offer of Brunck, to whom Heyne introduced him, and who wished to have the assistance of a young scholar for his edition of the Greek poets. Schneider accordingly went to Strasburg, where he spent three happy years. The influence of the bold and sometimes rash criticism of Brunck is manifest in many of Schneider's works, especially his earlier publications. At Strassburg he first began to pay attention to anatomy, botany, and zoology, which he did principally with a view to elucidate the antient writers in these departments of knowledge. Here he also published a work on Pindar, 'Versuch über Pindars Leben und Schriften,' 1774, 8vo.; and Plutarch, 'De Puerorum Educatione, acced. bina ejusd. et Marcelli Sidetae Fragmenta,' 1775, 8vo. Conjointly with Brunck he made an edition of Oppian's Poems, 1776, 8vo., and a collection of the fragments of Pindar, 1776, 4to. In the same year Schneider was invited to the professorship of philology and eloquence in the university of Frankfort on the Oder. He considered the lectures in the university to be of much less importance than they were generally supposed to be, and accordingly he not only encouraged his pupils to private study, but himself set a most active example. His principal attention however was directed to natural history, and those antient works on this subject which were totally neglected by scholars; and he not only availed himself of everything that was within his reach, but undertook journeys to most of the great towns of Germany, where he thought he might collect information from the public and private collections of natural objects. The first work that he published at Frankfort was an essay, 'De dubia Carminum Orphicorum Auctoritate et Vetustate.' In 1811, the university of Frankfort was transferred to Breslau. Schneider followed the university, and continued to hold the same office. In 1816, on the death of Bredow, who was chief librarian to the university, Schneider gave up his professorship, and became Bredow's successor, a post much more suited to his taste. In this office he continued until his death, on the 13th of January, 1822.

Schneider was a man of simple habits often bordering on coarseness, which was probably the consequence of his residence with his uncle, who had no time to attend to his education, and left the boy to the influence of his rough companions. But he was free from pride or pretension, and took a delight in assisting young men in their studies. As a philologer he ranks in some respects among the first of modern times, and in the department to which he principally devoted his attention he stands almost alone. The criticisms of his maturer age are much more sober and sound than those of his earlier years, though in his German works on natural history he often shows much more learning than judgment and good sense.

The works which he published after he settled at Frankfort on the Oder may be divided into two classes:—1, those of a philological and critical character, most of which relate to the subject of natural history as known to the antients; and 2, works on natural history, both antient and modern. The works of this latter class are for the most part written in German. Among the former we shall mention his editions of Demetrius Phalereus 'De Elocutione

Liber,' Altenburg, 1779, 8vo.; Aelian, 'De Natur. Animal.,' Græce et Lat., Leipzig, 1784, 2 vols. 8vo. In 1790 he undertook the revision of the works of Xenophon, edited by Zeune, and added himself a new and critical edition of the other works of Xenophon with valuable notes. The whole collection of Xenophon's works edited by Schneider consists of 6 vols. in 8vo., and the last edition of them appeared in 1815-1825 at Leipzig. Nicander, 'Alexipharmaca, seu de Venenis, &c., Carmen, cum Vers. Lat., Schol. Graec.' &c. Halæ, 1792, 8vo; Nicander, 'Theriaca,' Leipzig, 1816, 8vo.; 'Scriptores Rei Rusticæ, cum comment. illustr., et fig.,' Leipzig, 1794-97, 4 vols. 8vo.; 'Aristotelis De Animalibus Historiæ Libri X., Graec. et Lat., cum comment. et indice,' Leipzig, 1812, 4 vols. 8vo. In 1797 he published the first edition of his 'Greek Dictionary,' the best that had appeared since the days of Henry Stephens. A second edition appeared in 1805, and a third in 1820, 2 vols. 4to.; and in the following year, he published a supplement to it. He also edited 'Theophrasti Characteres, cum viror. doct. conject. correcti,' Jena, 1799, 8vo.; 'Eclogæ Physicæ,' 1801, 2 vols. 8vo., comprising the most important parts of natural history known to the antients, with very valuable notes. 'Argonautica Orphei,' Jena, 1803; Vitruvius, Leipzig, 1807, 3 vols. 8vo.; 'Aristotelis Politica,' with a Latin translation, Frankf. on the Oder, 1809, 2 vols. 8vo.; Æsop's 'Fables,' Breslau, 1812, 8vo.; 'Epicuri Physica et Meteorologica,' Leipzig, 1813, 8vo.; Oppianus, Cynegetica et Halieutica,' with a Latin translation, Leipzig, 1813, 8vo. In this edition he has withdrawn many of the bold corrections of his former edition. 'Anonymi Œconomica, quæ vulgo Aristotelis falso ferebantur,' Leipzig, 1815, 8vo.; 'Theophrasti Opera omnia,' Leipzig, 1818-21, 5 vols. 8vo., to which in 1822 a sixth volume was added. His German works on natural history, and his short essays on various subjects, are extremely numerous: a complete list of them is given in Meusel's 'Gelehrtes Deutschland.'

SCHNURRER, CHRISTIAN FRIEDRICH, was born October 28, 1742, at Canstadt in Würtemberg. He studied at Tübingen, where, in 1762, he began his career as an academical teacher. Four years later he went to Göttingen, and afterwards made a journey through Holland, England, and France. On his return, in 1770, he was appointed professor of philosophy at Tübingen, where he subsequently lectured on the Greek and Oriental languages. For some time he was ephorus of the theological faculty, and in 1805 he was appointed chancellor of the university. After the French were driven from Germany, Schnurrer became a member of the Chamber of Deputies in Würtemberg, and although his official position prevented him from joining either party, he was always an advocate of liberal principles, and was from the first opposed to the design of the government to restore the constitution of Würtemberg as it had been previous to the year 1806. In 1817 the king of Würtemberg, in accordance with the promise made at the Congress of Vienna, gave a new constitution to his kingdom, and on this occasion Schnurrer declared that he would willingly vote for its acceptance, provided the king would introduce it in the form of a contract between himself and his subjects. In consequence of this boldness Schnurrer was deprived of his office, though two years afterwards the government was obliged to adopt the plan proposed by him. After his dismissal Schnurrer sold that part of his extensive library which consisted of Arabic literature, and which he had chiefly collected during his stay in England, to Mr. Knatchbull. Schnurrer died on the 10th of November, 1822.

Schnurrer was a man of great and accurate learning, especially in Oriental literature, but his official duties prevented him from producing many great works. His writings, though numerous, are mostly small dissertations on historical and theological subjects, written on various occasions and in programs. From the year 1793 he took an active part in a literary journal called 'Tübinger Literarische Nachrichten.' His 'Bibliotheca Arabica,' the last edition of which appeared at Halle, 1811, is a work of great learning and diligence. His 'Orationum Academicarum Delectus Posthumus,' was edited by Paulus, Tübingen, 1828. The Life of Schnurrer has been written by Weber, under the title of 'C. F. Schnurrers Leben, Charakter, und Verdienste,' Canstadt, 1823.

SCHÖFFER, PETER, one of the inventors of printing, was a native of Gernsheim in the country of Darmstadt. In early life he followed the trade of a copyist at Paris; but, about 1450, removing to Mayence, gained employ in the printing-office recently established there by Gutenberg and Fust; upon the dissolution of the partnership between whom, he joined Fust as a principal, and by inventing the puncheon gave completion to the discovery of printing. He afterwards married Fust's daughter.

Schöffer's name first appears with Fust's at the end of the Psalter of 1457, and they continued to print jointly till Fust's death in 1466. The list of their books has been already given in a former volume. [FUST.]

The list of books printed by Schöffer alone after Fust's death is a long one. It will be found in Panzer's *Annals*, vol. ii., 4to, Norimb., 1794, p. 117-136, with an enumeration of other works known as his by the type, but without his name.

The following were printed by him previous to 1470, namely, the 'Secunda Secundæ' of S. Thomas Aquinas; and the second edition of the 'Constitutions of Clement V.,' 1467; the 'Institutions of Justinian,' 1468; St. Thomas Aquinas's 'Commentary on Peter Lombard,' fol., 1469; and the second edition of the 'Sixth Book of the Decretals of Pope Boniface VIII.'

His last work of all was a Latin Psalter, fol., 1502; in which year he is supposed to have died; leaving behind him John Schöffer his son, and successor in his business, whose name appears alone as the printer of 'Mercurius Trismegistus,' in 1503, and of many subsequent works.

(Panzer, ut supr., tom. ii., p. 117-136; tom. vii., p. 406, Meerman, *Orig. Typogr.*, 4to. Hag. Com., 1765; *Biogr. Universelle*, tom. xli., pp. 208, 209.)

SCHŒNANTHUS. In the article JUNCUS ODORATUS reference has been made to Schœnanthus for an account of this substance, which is Lemon Grass, as well as of Calamus aromaticus, which Dr. Royle is of opinion belongs to the same genus, that is, Andropogon. As many writers on this substance and on the spikenard of the antients have confounded together much of what refers to these two very distinct substances, it will be preferable to treat of both under the more popular head of SPIKENARD.

SCHŒPFIA, a small genus of the natural family of Loranthaceæ, named after Schöpf, a German botanist who described the plants in the neighbourhood of Ulm. The genus is characterised by having the flowers hermaphrodite, margin of the calyx entire, tube adnate to the ovary, very narrow, caliculate at the base. Corol tubular, united into one piece; limb 5- rarely 4- to 6-cleft. Stamens equal in number to the lobes of the corol, and inserted before them into the tube of the corol. Anthers ovate or roundish, dehiscing laterally by a double chink. Style erect. Stigma capitate or 3-lobed. Ovary 3-celled, with an ovule in each. Leaves alternate, petiolate, entire, feather-nerved. Peduncle axillary, usually many-flowered. The genus Schœpfia is found in the West Indies and in the Andes of Peru, also in the Pundua Mountains near Lower Assam, and in Nepal, thus being common to both the old and new world.

SCHOLASTIC PHILOSOPHY. [THEOLOGY.]

SCHOLIUM (Σχόλιον), (Mathematics), a name given by the older mathematical writers to the remarks which follow a proposition. A scholium must be distinguished from a corollary, inasmuch as the latter necessarily contains some deduction from the demonstration which precedes; which is not the case with the former. A scholium is an appendix containing general remarks upon the scope of a proposition, its application, or its history: everything in short which is not an absolute corollary. The word is used by Cicero (*Ep. ad. Att.*, xvi. 7) in its general sense of remark, commentary, or explanation.

SCHOMBERG, ARMAND FREDERIC DE, was of German family, but born of an English mother, of the house of Dudley, in or about 1619. Bred a soldier, he began his career in the Swedish army, during the Thirty Years' War, and was punished by the Emperor for the part which he took by confiscation of his property. He then entered the service of the Netherlands, and afterwards that of France, in which, from 1650 to 1685, he led an active and distinguished life, and rose to the rank of marshal. In 1685, the revocation of the Edict of Nantes drove him, with many other of the best and most useful subjects of France, to seek liberty of conscience in another country; and he betook himself first to the service of Portugal, then to that of the Elector of Brandenburg, and lastly to that of the Prince of Orange, when about to make his descent upon England in 1688. In our own country the course of events gave little opportunity for the exercise of military talent. Schomberg was sent to Ireland in 1689, as commander-in-chief; where, during ten months, his successes fell short of the expectation raised by his high reputation. Age perhaps had made him over-cautious. He was killed, July 1, 1690, by a pistol-shot, at the battle of the Boyne, while gallantly leading a regiment of French Protestants across the river.

SCHÖNBURG is a part of the kingdom of Saxony, consisting of the possessions of the antient house of Schönburg, situated between the circles of the Erzgebirge, Leipzig, and Meissen, and the principality of Altenburg. The members of this family had formerly a seat and vote in the bench of counts of the Wetterau, but they never were able to acquire all the rights of independent princes of the empire, and were constantly at variance with the princes of the house of Saxony. The differences between the two parties were arranged by an agreement in 1740, which continued in force with some modifications till 1815, when it was confirmed by the Congress of Vienna. The sovereignty is vested in the king of Saxony, but many important rights are retained by the members of the houses of Schönburg, such as the establishment at Glauchau of a distinct government and administration for all the possessions of the family. The family of Schönburg is now divided into two principal lines, that of the princes of Schönburg-Waldenburg, and that of the counts of Schönburg-Penig, which is again subdivided into two branches. The territories of the whole are 345 square miles in extent, with 112,000 inhabitants. The country is mountainous, but very fertile, producing corn, timber, flax, fruit, potters'-clay, cinnabar (which is not found in any other part of Saxony), and slate. The inhabitants are very industrious, and, besides their agricultural occupations, have considerable manufactures of linen, woollen, cotton, paper, and earthenware. The chief towns are Waldenburg on the Mulda, the residence of the prince, which, including the suburbs, has 4500 inhabitants; near it is the prince's country-seat Greenfield, with a fine park. Glauchau, the chief town of all the territories of Schönburg, is the seat of the joint government; it is situated on the Mulda, over which there are two bridges, and lies, in the form of a semicircle, on seven low hills. There are two palaces, the residences of the counts of Schönburg-Penig, a church with a celebrated organ, an orphan asylum, a theatre, iron and copper works, and manufactures of linen, woollen, cotton, leather, and needles. There are many handsome houses in this town, which has 6000 inhabitants. George Agricola was born here in 1494.

SCHONEN. [SWEDEN.]

SCHOOLS, PRIMARY. The education supplied by primary schools may be considered as embracing not only that of young children, but that of the children of the poor in general. The consideration of it involves the whole matter of what is generally termed 'popular education,' comprising the Sunday-school, the Day-school, and the Infant-school.

The theory of the English church establishment supposes that the youth of the country are directly or indirectly under the care of the clergy for the purposes of education; and there was a period in which none but the clergy were engaged in the business of instruction. Various circumstances however, added to the increase of population, its growth in wealth, the rise of new commercial interests, together with the spread of dissent, caused the people to outgrow the very scanty provision made for their education, so that towards the end of the last century an opinion became prevalent of the urgent necessity both for the extension and the improvement of the means for the education of poor children. The result was the commencement in England of a series of efforts which have led both here and abroad to the most beneficial results.

Raikes of Gloucester is generally considered the founder of Sunday-schools, but other persons preceded him in the benevolent effort to make the Sunday subservient to the education of neglected children. The Rev. Theophilus Lindsey, shortly after he had taken possession of his vicarage of Catterick in Yorkshire, in 1763, employed in this way a portion of each Sunday. Mrs. Cappe, in her 'Autobiography,' says, 'At two o'clock, before the commencement of the afternoon service, Mr. Lindsey devoted an hour alternately to catechising the children of the parish and to expounding the Bible to the boys of a large school to the number of about 200. After evening service, Mr. Lindsey received different classes of young men and women in his study for the purpose of instruction; and Mrs. Lindsey, in like manner, in another apartment, had two classes of children, boys and girls alternately.' Mrs. Cappe, wife of the Rev. Newcome Cappe of York, then Miss Harrison, 'endeavoured,' she observes in her Life, 'to imitate at Bedale the example which I so much admired at Catterick. I established a sort of Sunday-school there, collecting together a number of poor children, whom I assisted in learning to read, giving them books, &c., teaching them Dr. Watts's shorter catechism, together with his devotional hymns, and endeavouring to give them such general instruction as might enable them to read their Bible with more intelligence. I had no place in which to receive them but the back kitchen, which being small, we were exceedingly crowded; but they grew attached to me, and liked to attend; and in order to prevent confusion, I divided them into classes, which succeeded each other; so that on the Sunday I was occupied by a succession of children nearly the whole day, except the time which was spent at church.'

In the year 1769 a Sunday-school was commenced by Miss Ball at High Wycombe, Bucks. She was a lady of great piety, and very earnest in doing good. Her custom was to assemble as many as thirty or forty children on Sunday morning, in order to hear them read the Scriptures and repeat the Catechism and the Collect, preparatory to going to church.

The idea of Sunday instruction was communicated to Mr. Raikes by the Rev. Mr. Stock, curate of St. John's, Gloucester. The following is Mr. Stock's own account, in a letter, dated February 2, 1788:—'Mr. Raikes meeting me one day by accident at my own door, and in the course of conversation lamenting the deplorable state of the lower classes of mankind, took particular notice of the situation of the poorer children. I had made, I replied, the same observation, and told him, if he would accompany me into my own parish, we would make some attempt to remedy the evil. We immediately proceeded to the business, and, procuring the names of about ninety children, placed them under the care of four persons for a stated number of hours on the Sunday. As minister of the parish, I took upon me the principal superintendence of the schools and one-third of the expense. The progress of this institution through the kingdom is justly to be attributed to the constant representations which Mr. Raikes made, in his own paper (the 'Gloucester Journal'), of the benefits which he perceived would probably arise from it.' The following is a copy of the inscription on a handsome marble monument, erected several years ago in the chancel of the parish church of St. John the Baptist, by a subscription of the inhabitants of the parish, written by the Rev. F. T. Bailey, the present rector and Mr. Stock's successor:—'In memory of the Rev. Thomas Stock, A.M., rector of this church, who first suggested the institution of Sunday-schools, and, in conjunction with Mr. Robert Raikes, established and supported the four original Sunday-schools in this parish and St. Catherine's in 1780 He died December 27th, 1803, and was interred in St. Aldate's Church.'

Mr. Raikes's views may be gathered from the following paragraph which he inserted in the 'Gloucester Journal' of November 3, 1783, of which he was proprietor and editor:—'Some of the clergy in different parts of this county, bent upon attempting a reform among the children of the lower class, are establishing Sunday schools for rendering the Lord's-day subservient to the ends of instruction, which has hitherto been prostituted to bad purposes. Farmers and other inhabitants of the towns and villages complain that they receive more injury in their property on the Sabbath than all the week besides; this in a great measure proceeds from the lawless state of the younger class, who are allowed to run wild on that day, free from every restraint. To remedy this evil, persons duly qualified are employed to instruct those that cannot read; and those that may have learned to read are taught the catechism and conducted to church. By thus keeping their minds engaged, the day passes profitably and not disagreeably. In those parishes where this plan has been adopted, we are assured that the behaviour of the children is greatly civilised. The barbarous ignorance in which they had before lived being in some degree dispelled, they begin to give proofs that those persons are mistaken who consider the lower orders of mankind as incapable of improvement, and therefore think an attempt to reclaim them impracticable, or at least not worth the trouble.' For nearly thirty years Raikes survived to witness the growing effects of his benevolent undertaking, which to the present hour has not ceased to diffuse benefits over the land and over the world at large.

The 'National Schools' took their rise from the impulse given by Dr. Andrew Bell. He was a native of St. Andrew's in Scotland. After having gone through his studies at the university of that place, and taken holy orders in the English Church, he proceeded to the East Indies as a chaplain in the East India Company's establishment. Becoming superintendant of the Male Asylum at Madras, he was struck with the Hindu mode of writing in sand, and other peculiarities in tuition, which on his return to England he made known by several publications. The advantages of the methods which he recommended were ultimately acknowledged, and the system was adopted; but a similar project having been set on foot by Joseph Lancaster, a controversy arose, which eventually led to the formation of two societies, namely, the National Society, and the British and Foreign School Society, the former of which is chiefly supported by the Establishment, and is designed to further popular education in connection with teaching the doctrines of the English Church; the second, which is chiefly supported by dissenters, offers education to all whose parents are willing that their children's instruction should be based on the Bible. Dr. Bell, after having been rewarded with honours and emoluments in the church, died at Cheltenham, Jan. 28, 1832, bequeathing 120,000*l.* for the encouragement of literature and the advancement of education.

Joseph Lancaster, born in 1771, was a member of the Society of Friends. His father was a soldier in the foot-guards. Moved by a benevolent feeling towards the neglected children that surrounded his father's residence in the Borough Road, Southwark, he opened a school for their benefit, and obtaining a room without cost from his father, he fitted it up at his own expense; and before he was eighteen years of age had ninety children under his care. This was in 1798, a period of scarcity as well as of general ignorance; and necessity prompted him to make experiments in education, with a view to economy in teaching. He early attracted the attention of the Duke of Bedford; and in 1805 was honoured by an audience on the part of George III., who on this occasion expressed the memorable words, 'I wish that every poor child in my dominions may be able to read his Bible.' Being a conscientious dissenter, he declined flattering overtures of worldly advantages which could be enjoyed only by his joining the established church. From 1807 to 1811, he travelled in the kingdom nearly seven thousand miles, and lectured to nearly 50,000 persons; and thus he gave a great impulse to elementary education. In 1812 he attempted to establish a school for children of opulent parents; but he became insolvent, and in 1818 emigrated to the United States, where he was well received. In this country he rendered much service to education, but the effect of his labours was lessened by his want of prudence. In 1829 he visited Canada, and was honourably welcomed. The parliament of Lower Canada voted him several grants for educational purposes. Again he experienced great pecuniary difficulties, but some of his old friends united to purchase for him a small annuity. He died at New York, on the 23rd of October, 1838, having essentially contributed to the establishment of the system of mutual instruction in most parts of the civilized world, under the name in England of 'Lancasterian Schools,' and under the patronage of the British and Foreign School Society.

Infant-schools are designed to prevent evil, and to train young children in the practice of virtue and kind feeling, as well as to the pursuit of knowledge, particularly in those cases in which the parents from their occupation are unable, or from their dispositions are unwilling, to take proper care of their offspring. At present having been found o great service in the humbler ranks of society, they are slowly extending themselves among the middle classes. If the whole of English education were planned with similar foresight and care, and conducted on similar principles, so as to make one connected series from infancy to manhood, extending through all ranks, modified only by the peculiar facilities and destination of each, the highest advantages would follow. The infant-school system makes the school-room into a nursery and a playground, in which virtue, intelligence, and love preside, direct the movements, and regulate and foster the emotions. The scholars are instructed while they play, and learn to associate pleasurable feelings with their school pursuits.

The real founder of Infant-Schools appears to have been the Pastor Oberlin, who appointed conductrices in each commune of the Ban de la Roche, and paid them at his own expense: he also procured rooms where children from two to six years old might be instructed and amused. (*Journal of Education*, vol. i., p. 367, &c.) An infant-school (Bewahrschule) was also founded in Germany by the Princess Pauline of Lippe-Detmold, at Detmold, in 1802, for children from one to four years of age.

If Mr. Owen was the first Englishman to establish an infant-school on a large scale, and for definite purposes—and certainly the school which he founded at New Lanark in Scotland at least ranks among the earliest—he was aided in forming the idea by the wife of the Rev. William Turner of Newcastle-on-Tyne, who in the year 1818, when in conversation with Mr. Owen, remarked, that in her attention to the education of girls, she had frequently wished some means could be adopted for getting poor children taken out of the hands of their parents at an earlier age, before they had formed bad habits at home and among the idle children around them. Much was said on both sides on the desirableness of infant-schools, which Mr. Owen immediately established on his return to Lanark. Much credit is also due to Lord Brougham for the interest which he manifested and the valuable aid which he gave in the establishment of infant-schools. Mr. Wilderspin has however laboured more than any other person, and with more success, in the founding of these institutions, and also in perfecting their discipline.

To no one however can the impulse which has been given to early education be so justly ascribed as to Pestalozzi, whose labours were characterised by an earnestness which was the result of a profound conviction, and who has infused into education his own enlightened views and benign spirit.

Henry Pestalozzi was born at Zürich in 1745, of respectable parents. Having lost his father at an early age, he was left to the care of his mother, who was extremely poor. Eccentricity seems to have been a marked feature in his early character, which was distinguishable rather for kindness and gentleness than strength of intellect. A deep dissatisfaction with existing modes of education, resulting from his own reflections, was increased by the study of the 'Emile' of Rousseau. This work confirmed him in the pursuit of what may be termed educational truth, and gave a stimulus to his inquiries; but it gave him no positive knowledge, except that of his own ignorance, and of the prevalent ignorance on tho subject. A severe illness, the result of the intense action of his mind, ended in bringing him to a fixed determination to abandon himself, as his biographer terms it, 'to the education of providence.' He apprenticed himself to a farmer: in due time he became master of a tract of waste land, applied himself to its cultivation, became interested in a cotton manufactory, and was, by the experience which he acquired in going through these concerns, convinced that the prevailing system of popular education was not fitted to prepare men either for the duties or the enjoyment of life. He resolved on an educational experiment. He selected his pupils from the very dregs of the people. His establishment was converted into an asylum, where 50 poor children were provided with food, clothing, and instruction. His object was national, and he desired to show the state how the poor might be taught to instruct and improve themselves; and hence one of his great principles—self-education. His plan was defeated, but not without having been attended with beneficial results to upwards of one hundred poor children, and a great increase of experience to himself, which he communicated to the world in several attractive and instructing works. After many difficulties, Pestalozzi, with the aid of government, entered on another educational experiment, under circumstances of the most unfavourable nature both within and without the establishment. Deprived of all the ordinary supports of authority, he threw himself on the power of love in the children's hearts, as tho only available means of securing obedience. The effect corresponded to the expectation of the teacher. The whole of his school apparatus consisted of himself and his pupils. How was he to teach them? At last, after many trials and failures, he was led to teach them by word of mouth instead of books, by realities instead of signs.

A war broke up his establishment. His mind and encumstances were embarrassed, and ridicule assailed him. But he persevered, and became an assistant in a dame-school. A wider sphere however opened out before him. The Swiss government gave him a small pension, and an empty castle, which contained rooms enough, but hardly anything else. He set to work, and the school at Burgdorf was soon a scene of activity, in which teacher and disciples were trained as well as children. But he had offended the aristocratical canton of Bern by his liberality, and he was obliged to remove into the Canton de Vaud. Here, at the castle of Yverdon, he had nothing but bare walls and beautiful scenery. Yet even this soon became a busy and a happy spot, for he made his school a Christian family, in which persons of all ages, of all ranks, and of the most opposite character were united by the unaffected love of Pestalozzi. But he was more fitted to theorise and originate, than to work out his own ideas: his last establishment fell to pieces for want of a proper director. He died at the age of 80, after having reaped no other reward for his labours than his own inward satisfaction.

Were the conviction universal that the children of the poor ought to be educated, the devising of a suitable method of instruction would be comparatively easy. Undoubtedly those who admit the utility and necessity of educating the poor are a large, a powerful, and an increasing body. But even of those who take part in the promotion of popular education, there are many who act rather from compulsion than choice, who would not advance the cause if they could retain their social influence without doing so, and who consequently must not be expected to do more for it than their own party interests may seem to require. And if, on the one side, there is a large body of persons who wish to educate the people because it is for the general interest that they should be educated, and from the assurance that there is no evil which may not be feared from ignorance, and no good which may not be anticipated from a well-educated community; there is on the other side a considerable number of persons who desire to resist the diffusion of popular education. 'It is impossible,' says the assistant poor-law commissioner, Edward Twisleton, Esq. (*Reports on the Training of Pauper Children*, 1841), 'to shut one's eyes to the fact that a certain portion of the upper and middling classes harbour a rooted distrust of any plan for the education of the poor. In discharge of my ordinary duties I have often had an opportunity of seeing this feeling manifested in an undisguised form. . . . Amongst many small farmers and some of the gentry, unwillingness to educate the poor is openly defended by argument; and a merchant of a seaport town gravely assured me, not long ago, that an agricultural labourer was very little above a brute, and that to educate him would merely have the effect of rendering him dissatisfied with his situation in life.'

A correct description of what the advocates of popular education mean by that term would be the best answer to many current objections, and the general tenor of these observations may perhaps do something to that effect. Many persons confound education with instruction, whereas instruction is only an instrument in education. Education is the leading out, the unfolding, the training of all the human faculties under such an instrumentality and with a view to such ends as the capacity of each individual, his position in society, opportunities, and prospects may justify or require; and it seems difficult to understand how such a discipline can be injurious either to the individual himself or to society. Experience however has decided this question. The authority whose words have just been given emphatically declares 'there is reason to believe that half the pauperism and crime which prevails in the world arises from the corruption of stagnant ignorance and from defective moral and religious training, and that to remove and remedy these causes of vice is the only expedient which affords the least prospect of success for promoting the moral health of the rising generation.' The following quotation is from the Report of the Inspector of National Schools, the Rev. Edward Field (*Twenty-ninth Report of the National Society, for* 1840, p. 144):—'Let it not be forgotten, that the persons most actively employed in the agricultural riots of 1830 were uneducated and ignorant in the last degree. From two adjoining parishes in Wilts, fifteen agricultural labourers, I was told, were at that time transported for life. It cannot, I fear, be doubted that the materials for such an explosion yet remain in some of the rural parishes of Dorset and Wilts. Those materials are poverty and ignorance, which may again, whenever the match is applied by artful and designing men, spread waste and terror through the land. At present, in the parishes alluded to, the poor labourers know not (and how without instruction should they know?) either how to better their condition or to bear it. On the occasion of the last assizes, the following important and valuable remarks are reported to have been addressed by Judge Coleridge in his charge to the grand jury at Devizes:—"Having disposed of the calendar, he would now advert to a subject connected with the county. He had before him a comparative table of the committals in the different counties in England from 1834 to the present time; and he found that in Wiltshire in 1834 there were 384 committals, and that in 1839 there were 428. This was not a very large increase, considering the increase of population; but still it would have been more pleasing to have found a decrease. He had then looked to see in what manner these parties had been educated, and he found that out of the whole 428 only 32 could read and write well. This spoke negatively pretty strongly in favour of education. It was not therefore an unfair inference, that if they increased the amount of education, they might probably diminish the number of those who made small attempts on the property of others. There were 250 who could read and write imperfectly, *but reading and writing imperfectly was no education at all;* they could read their Bible to very little effect; a very large proportion must be in the very beginning of education. This showed how desirable it was to advance the sound and religious education of the poorer classes." Such remarks from such a quarter must help to shake the prejudices which still unhappily remain in some places against the education of the poor.'

There is also most valuable testimony in 'Evidence of employers of labourers, on the influence of training and education on the value of workmen, and on the comparative eligibility of educated and uneducated workmen for employment,' given in the 'Report to the Poor-Law Commissioners on the Training of Pauper Children,' 1841. Albert Escher, Esq., one of the firm of Escher, Wyss, and Co., of Zürich, employing from six to eight hundred men in their machine-making establishment at Zürich; employing also about two hundred men in their cotton-mills there, and about five hundred men in their cotton-manufactories in the Tyrol and in Italy, these men being of different nations, Swiss, Germans, French, English, Scotch, &c., states, 'As workmen only, the preference is due to the English, because they are trained to special branches; as men of general usefulness, I should prefer the Saxons, because they have had a very careful general education, which has rendered them fit to take up any employment to which they may be called. . . . The Scotch get on much better on the Continent than the English, which I ascribe chiefly to their better education, which renders it easy for them to adapt themselves to circumstances. Knowing their own language grammatically, they have good facility in acquiring foreign languages. They have a great taste for reading, and always endeavour to advance themselves in respectable society, which makes them careful of their conduct and eager to acquire such knowledge as may render themselves acceptable to better classes. . . . The Dutch are, like the English, quite specially trained, but their education is not of a very high order, but very sound, and decidedly superior to the English. It is an education in which economy and domestic and public respectability of conduct are particularly enforced; and we have found them to be particularly honest, economical, orderly, and trustworthy men. . . . The English are in conduct the most disorderly, debauched, and unruly, and least respectable and trustworthy of any nation whom we have employed (and in saying this I express the experience of every manufacturer on the Continent to whom I have spoken, and especially of the English manufacturers, who make the loudest complaints). These characteristics of depravity do not apply to the English workmen who have received an education, but attach to the others in the degree in which they are in want of it. Refinement produced by education would be beneficial to workmen, for in the present state of manufactures, when so much is done by machinery and tools, and so little by mere brute labour, mental superiority, system, order, punctuality, and good conduct—qualities all developed by education—are becoming of the highest consequence. . . . The uneducated English workmen at Zürich were so disagreeable as lodgers, having such disorderly and bad habits, spoiling the rooms, emptying vessels out of the windows, offending people in the streets, contravening the police regulations, that they found it difficult to get lodgings, and are obliged to pay more for them. Some of the best description of the English workmen—one of the most superior, to whom we gave 5*l.* a week wages, had so lowly bred a family (he came from Oldham, where they are notorious for want of education) that his salary scarcely sufficed for his expenses—do not take so high a standing as foreign workmen who only receive 50*l.* a year. . . . I invariably find that the best educated of our workmen live in the most respectable manner at the least expense, or make their money go the farthest in obtaining comforts. Of the English, the educated workmen are the only ones who save money out of their very large wages. The most educated of our British workmen is a Scotch engineer, who has a salary of 3*l.* a week, of which he spends about one-half; he lives in very respectable lodgings; he is always well dressed; he frequents reading-rooms; subscribes to a circulating library, purchases mathematical instruments, studies German, and has every rational enjoyment. We have an English workman, a single man, also of the same standing, who has the same wages, also a very sober person; but as his education does not open to him the resource of mental enjoyment, he spends his evenings and Sundays in wine-houses, because he cannot find other sources of amusement which presuppose a better education, and he spends his whole pay. . . . What pilfering we detect among our workpeople is invariably amongst the class which is lowest in education.'

James Kempson, of Philadelphia, cotton manufacturer, states that they do not like to take English workmen in the New England factories, because they are so dissipated and discontented. They are noted as the greatest drunkards in the country, and are much worse educated than Americans of the same class. Schools in the United States are encouraged, because they are regarded as of the greatest importance to the welfare of the community. William Fairbairn, Esq., of Manchester, states that a preference is always given to workmen who have received the best education; that in all questions respecting wages, the best educated are the most reasonable in their demands, and the most peaceable in their behaviour; and that the educated are more sober and less dissipated than the uneducated. Another employer, who had provided schooling for upwards of 200, stated in private conversation that at first the expenditure was given chiefly from a desire to make the people happy; but he subsequently found that had it all been done simply as an investment of capital, it would have been a highly profitable one; adding that he would not as a pecuniary speculation take less than 7000*l.* for his set of workmen, upwards of 800, in exchange for the uneducated and uncultivated workmen of another manufacturer opposite.

The Select Committee of the House of Commons on Education, 1838, declare that 'to the neglected education of the children of the working classes in populous places is to be chiefly attributed the great increase of criminals, and consequently of cost to the country.' From returns to parliament the committals for crime in England and Wales were in

1805	4,600	1828	16,500
1810	5,100	1832	20,090
1815	7,800	1836	20,984
1821	13,000	1837	23,612

That is, in 20 years (from 1810 to 1832) the committals increased fourfold, while the population increased only 32 per cent.

The following very important evidence on the effects of knowledge and ignorance was given before the Educational Committee, 1838, by John Corrie, Esq., a magistrate residing near Birmingham:—

'Are you chairman of the West Bromwich Union?—I am.

'What number does the West Bromwich Union comprise?—At the time the Union was made, the returns were 34,000, grounded on the census of 1831, and I believe there are now upwards of 40 000.

'From your knowledge of the poorer classes within that district, first of West Bromwich or the neighbourhood, do you think that education for the humbler classes is much wanted?—From what little experience I have had as a magistrate and as chairman of the Union, I should say it is greatly wanted, lamentably wanted.

'Does imprudence and drunkenness prevail among the humbler classes for want of some moral and better education?—There is very little education of any sort; that which there is, is of the most elementary kind; reading and indifferent writing; most of those (and especially the young) who come before the magistrates, and before the Union Board, are unable either to read or write; they have no knowledge of moral obligation, or very little; many of them have never been at any place of worship.

'Do you not consider that the neglect of any education, both moral and religious, which you describe, must be the source of much crime and cost to the country in consequence, and to the district in which they live?—Undoubtedly.

'Do you not think that a good system of improved education for these humbler classes, although it might in the first instance be the subject of some cost, would repay itself by a saving that would accrue from their improved habits in a few years?—I have no conception of any other means of forcing civilization downwards in society except education; there is a slight surface of civilization; these in certain circumstances have a little education, but the mass have none.

'Do you not think that if a tolerable education were provided for the humbler classes, that they would be more likely to enter into those provident societies which have been so much spoken of lately; savings'-banks and benefit societies, for providing against sickness and those other calamities which are incident to the situation of the poor?—The educated classes have the benefit of all the recorded experience of the past to guide them; these poor people have no recorded experience; their own feelings, or the little experience of their fathers and mothers, is all they have to guide them.

'Do you think it would be beneficial to them, and that they would be much more likely to enter into these provident societies, supposing the means of education were afforded?—I have no doubt on the subject whatever.'

Dr. J. P. Kay, 1841, thus speaks of the effect of education on pauper children: 'Ignorant of all that is good, but trained and practised in all evil; unintellectual, debased, and demoralised, the work of instruction and reformation sometimes appeared almost hopeless. But the rapid improvement of the children under a system of religious and moral teaching and of industrial training; their general decency of deportment; the proofs they afford of the influence of sound principles; and the apparent state of comfort in which they live, the simple result of cleanliness, discipline and regularity, attracted observation, and are now beginning to excite a feeling of jealousy out of doors.'

It is only very recently that correct notions respecting the actual state of popular education in this country have begun to prevail; and even now, in cases where its deficiency in amount is acknowledged, there often exist very erroneous conceptions of its value. These false ideas are to be mainly attributed to the fact that no means have existed by which a knowledge of the general state of education could be acquired. The statistics of education are quite a recent study; and even now, although something has been done by parliamentary committees, by 'The Manchester Statistical Society,' and other similar institutions, by 'The Central Society of Education,' and by the 'Committee of Council on Education,' still there are no means by which exact information on this subject can be obtained with respect to the country at large; and all that can be done is to present some facts ascertained in relation to particular places, from which some rude idea of the general condition may be deduced, and to make a rapid review of the quality of the education that is given.

The Parliamentary Committee on Education (1838) gave it as their opinion, that as regards the children of the working classes, it would be desirable to afford education to them from the age of three to thirteen; deducting from this number all the children of the rich or middle classes, they conclude that daily school education should be provided for one eighth of the population. They proceed to report that in five parishes in London, situated along the Strand and round Charing-Cross, 'some sort of daily instruction is afforded to about one in fourteen of the population, instead of one in eight.' In Bethnal Green, they state, 'there are from 8000 to 10,000 children for whom no means of daily instruction are provided. In that parish thousands are growing up uninstructed in their duty to God or man. . . . In this populous parish less than one in twenty are under daily education.' They furnish the following table:—

	PLACE.		Population.	Children of Working Classes at Daily Schools; viz.		TOTAL.
				Day and Dame Schools, Very indifferent.	Other better schools.	
1836.	Liverpool		230,000	11,336	14,024	25,000
1834.	Manchester . . .		200,000	11,520	5,680	17,100
1835.	Salford		50,810	3,340	2,015	5,350
—	Bury		20,000	1,648	802	2,451
1835.	Ashton . . . . Duckenfield . . . Staley Bridge . . .		47,800	. . .	. . .	2,496
1837.	Birmingham . . .		180,000	8,180	4,697	12,877
1837.	Bristol		112,438	- - not including scholars in private schools . .	5 to 15 . . Total . .	4,133 5,254
1838.	Brighton . .	B. & F.	40,634 in 1831	1,367	3,033	4,400
		National		863	3,247	4,110
1837.	West Bromwich . .		. . .	- - of 6,375 childⁿ under 14 years old.	. . .	1,554
1838.	Leeds . .	B. & F.	123,393 in 1831	- - no return of Dame or Day, but only Public schools.	2,971	
1838.	Sheffield . . .		96,692 in 1831	3,359	5,905	9,314
	Northampton .	B. & F.	20,000	1,011	1,215	2,226
		National		986	1,202	2,198
	Reading . .	B. & F.	15,595 in 1831	297	962	1,259
	Exeter		28,242 in 1831	2,045	1,830 including evening.	3,875
1836.	York		25,359 in 1831	1,494	2,697	4,191

Note.—The general result of all these towns is, that about one in 12 receive some sort of daily instruction, but only about one in 24 an education likely to be useful. In Leeds only one in 41; in Birmingham, one in 38; in Manchester, one in 35.

In regard to the most important of the places mentioned in the preceding table, the details are worked out to other interesting results in the following table taken from the same Report:—

BOROUGH OF	Estimated Population at period of Inquiry.	Children from 3 to 13 estimated, without deducting any from Number living between 5 and 15, according to Population Returns.	Number attending superior Private Schools, and belonging to Middle and Upper Classes.	Number of Children of Working Classes from 3 to 13 for whom Education should be provided. One-third being deducted from the whole Number between 3 and 13 for those privately educated, or employed, or sick, or prevented by Casualties from attending School, and also deducting the Number attending superior Private Schools.	Number of Children of Working Classes attending Endowed and Charity Schools, and Schools attached to Public Institutions and Infant Schools.	Very Ill Educated	Uneducated in Day Schools.	Total Uneducated and very ill Educated.	Annual Outlay required for Education by an efficient method, of Children now Uneducated, or very ill Educated, supposing the School-rooms to be built and kept in repair.	Number of Children very ill Educated.	Cost of providing for the foregoing Number of Children a worthless or indifferent Education by existing method, without Deductions for Losses by irregular Payments, &c.	One-fifth which may be deducted for irregular Payments and difference in Rate of Payment, &c.
						Number attending Dame Schools and common Day Schools.	Number Uneducated in Week-day Schools.					
									£.		£.	£.
Manchester .	200,000	50,000	2,934	30,400	4,103	11,624	14,641	26,265	19,500	11,624	17,398	3,479
Salford . .	55,000	13,750	882	8,285	1,776	3,357	3,172	6,509	4,800	3,357	5,215	1,043
Liverpool .	230,000	57,500	4,080	34,254	13,500	11,336	9,418	20,754	15,300	11,336	16,408	3,281
Bury . .	20,000	5,000	174	3,160	652	1,648	860	2,508	1,800	1,648	2,097	419
	505,000	126,250	8,070	76,099	20,031	27,965	28,091	56,036	41,400	27,965	41,118	8,222
				Ratio to population . .	1 in 25	. . .	. . .	1 to 9				
				Ratio to children of working classes who ought to be in attendance on school . .	1 in 3¾	. . .	. . .	5 to 7				
York . .	28,000	7,000	716	3,951	1,926	1,294	731	2,025	1,500	1,294	1,399	
				Ratio to population . .	1 in 14	. . .	. . .	1 to 14				
				Ratio to children of working classes who ought to be in attendance on school . .	1 in 2	. . .	. . .	1 to 2				

The Christian Instruction Society caused a district in London, near Barbican, to be visited, which contains 4577 children, of whom 3299 were not receiving any education whatever. Another district examined by the agents of the London City Mission contained 812 children under twelve years of age, and of that number only 65 were receiving education. They have stated generally also, that in thirty-four districts they found many thousands who went to neither day nor Sunday schools; and that they found 2744 adults who confessed that they could not read a letter. In the parish of Bethnal Green, out of 14,000 children, 4820 were educated, whilst 9180 had no daily education; and deducting the children who are receiving an education which scarcely deserves the name, there are less than 3000 who are properly instructed. By the following tabular view it appears that in the four places to which it relates there are not fewer than 32,697 children between five and fifteen years of age not attending any school whatever.

Numbers Receiving Instruction.	In the City of York, 1836.			In Four Parishes of the City of Westminster, 1837.*			In the Borough of Birmingham, 1838		
		Per Centage			Per Centage			Per Centage	
Number Attending.	Scholars.	Of the whole Population, estimated at 28,000	Of the Total Number of Scholars.	Scholars.	Of the whole Population, estimated at 43,000.	Of the Total Number of Scholars.	Scholars.	Of the whole Population, estimated at 180,000.	Of the Total Number of Scholars.
Day or evening schools only	2,228	7·96	39·85	3,215	7·46	67·40	10,902	6·05	39·41
Both day or evening and Sunday schools . .	2,521	9·00	45·09	889	2·06	18·63	4,141	2·30	14·97
Day and evening schools	4,749	16·96	84·94	4,104	9·52	86·03	15,043	8·35	54·38
Sunday-schools only .	842	3·01	15·06	666	1·55	13·97	12,616	7·01	45·62
Total { Day or evening and Sunday scholars }	5,591	19·97	100·00	4,770	11·07	100·00	27,659	15·36	100·00
Number of scholars estimated to be under 5 or above 15 years of age	1,020	. .	. .	1,112	. .	. .	5,835		
Children between 5 and 15 years of age attending school	4,571	. .	. .	3,658	. .	. .	21,824		
Estimate of the total number of children between 5 and 15 years of age .	7,000	. .	. .	10,750	. .	. .	45,000		
Number between 5 and 15 years of age not attending school	2,429	. .	. .	7,092	. .	. .	23,176		
	34·7 per cent.	. .	. .	65·9 per cent.	. .	. .	51·5 per cent.		

The agricultural districts are no better provided with the means of education. In the county of Kent the Central Society of Education caused eight parishes near Maidstone to be investigated, and they report that, of 262 children, 111 can neither read nor write; that, of 1300 children under fourteen years of age, 728 did not go to school; of these 728, 372 only attended day-schools; 513 children are returned as playing in the streets. In the Tendring Union in the county of Essex, out of 706 children, only 88 could read and write, and not more than 109 frequented a day-school. Of 2440 children in the Hay Union in Herefordshire, 612 only could read and write, not fewer than 1038 attended no school. In the locality where, in the year 1838, the fanatic who called himself Sir William Courtenay raised a tumult which ended in the loss of his own life and the life of several of his deluded followers—at Herne Hill, out of 45 children above fourteen, only 11 were on investigation found able to read and write, and out of 117 under fourteen, but 42 attended school, and several of these only occasionally; out of these 42, not more than 6 could read and write;—at the villa of Dunkirk no school whatever existed, though it comprised 5000 acres of land, and had a population of 700 persons;—at the village of Boughton, out of 35 children above fourteen years of age, 7 could read and write; of 119 under that age, 32 attended school. In February, 1840, Mr. Seymour Tremenheere, assistant poor-law commissioner, reported on the state of education in that part of Wales in which the Chartists under Frost made a sudden rising; he supplies the following table, which shows the number of common day and dame schools in each of these parishes respectively; the number of children frequenting them, and the proportion they bear to the whole population.

PARISHES.	Common Day Schools for the Elementary Education of the Working Classes	Dame Schools, and Schools for Children of from Two to Five Years of Age.	Total Children attending Day and Dame Schools.	Total Population.
Merthyr . .	15	8	1,322	34,000
Bedwelty . .	13	10	825	20,000
Aberystruth .	2	4	300	6,000
Trevethin . .	13	7	638	16,000
Mynyddislwyn	4	4	223	7,000
	47	33	3,308	83,000

There is no conflicting evidence in respect to the amount of popular education; all authorities agree in representing it as utterly inadequate. From the Report of the Diocesan Board of Education for Lancashire (1840) it appears that in the Macclesfield district, including a population of 129,54 education under the church is not more than 7 per cent. of the gross population; in the Liverpool district, including a population of 257,284, it amounts to no more than 6½ per cent.; and in the Manchester district, including a population of 504,672, it falls to 5½ per cent. on the gross population. The general statement is thus made, it having been premised that the returns of children not connected with the church only approach to the truth. Of the parishes and districts from whence returns have been received, the gross amount of population being 1,694,951, it appears that there are—

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* The parishes of St. Martin in the Fields, St. Clement Danes, St. Mary-le-Strand, and St. Paul, Covent Garden, including the Savoy.

	Schools.	Scholars.
In connection with the church	1725	164,388
Not in connection with the church	986	108,082

being at the rate of rather more than 9 per cent. under education in connection with the church, and of rather more than 6 per cent. under education in schools unconnected with the church. It must be remarked that these returns include schools of all kinds; and that the proportion per cent. would have been very much less had the number been given of those only who receive daily education. The Diocesan Report for the Diocese of Peterborough (1840) speaks thus—

'The Board has also ascertained that there is a lamentable deficiency in the amount of church-education, both daily and Sunday, for the poorer classes. Thus, in Leicester only one-seventeenth of the population, as calculated according to the census of 1831, is receiving instruction from national or other parochial schools in any direct and recognised connection with the church. A like deficiency is seen to exist in other places of a smaller size and population, as *e.g.* in one parish of 6491 inhabitants the proportion of children receiving church-education to the whole population is one-seventeenth; and in others as follows:—

Population.	Proportion.	Population.	Proportion.
2402	one-twenty-second.	842	one-seventeenth.
2174	one-tenth.	726	one-fourteenth.
2017	one-twentieth.	627	one-sixteenth.
1638	one-sixteenth.	545	one-eighteenth.
1602	one-sixteenth.	518	one-sixteenth.
1500	one-thirty-fifth.	442	one seventeenth.
1245	one-seventeenth.	342	one-seventeenth.
1211	one-fifteenth.		

Another painful circumstance brought to light by the researches of the Board is, that 'there are no fewer than eighty parishes, nearly one-third, that is, of those from which the returns have been received, where there is at present no daily church-school for the education of the poor; and amongst these cases there are instances of parishes with 3000, 2000, several of 1000 inhabitants, and from eighteen to twenty with a population varying from 500 to 900.

'Nor must it be supposed that the wide field for education in this county has been filled up by the different denominations of dissenters. Such a supposition would be altogether erroneous; for although the returns which the Board have received with regard to dissenting schools are not nearly so full and explicit as they could have wished to possess, yet do they nevertheless abundantly warrant this conclusion at least, that three-fourths of such schools are only Sunday-schools, and that there seems to be no machinery whatever among them for any general and regular system of daily instruction.'

The Report for the Diocese of Salisbury states 'that besides parishes of small population, there are some with a population of above 600 destitute of any school; and a few even much larger, where the education is altogether insignificant; and that above 20,000 children attend Sunday-schools only.' The last Report of 'the National School Society,' in the 'extracts' which it gives from applications made to it from all parts of the kingdom, supplies the following and other similar facts:—'Immense educational destitution in this populous parish, 20,000 souls without a single national school:' 'The condition of this large parish, now estimated at above 100,000 souls, is, in respect to the want of schools, most deplorable; at least six school-rooms are wanted:' 'There is only one small school for the daily education of the poor in the whole parish, containing about 12,000 inhabitants; that school educates about 100. As one result of this neglect, the parish became last year the focus of Chartism; and the most bitter spirit of disaffection still exists among the lower classes:' 'The population of the village of which I am the incumbent is not less than 20,000; there is no free-school in the whole place; hundreds of children receive no education whatever:' 'I am vicar of a parish which contains a population of 10,000 souls, and I grieve to say there is but one school-room in it:' 'Our situation is briefly as follows: the parish contains 1500 souls: there is nothing which can with propriety be called a school; the demoralization and extreme ignorance which prevail among this mass of human beings is truly deplorable; no language of mine can convey any idea of its extent:' 'I find a population of 10,000 souls committed to my charge with only one church, and a still smaller school in connection with the church:' 'The population of the township is about 15,000; we have no definite school; we rent two small places, which swallows up the subscriptions:' 'The district belonging to my church contains a population of 5000, and I regret to say that the children are in a state of darkness and ignorance beyond description:' 'This parish is without a building of any kind wherein to assemble the children either for a Sunday or a week school:' 'I am the curate of a poor parish, with 3000 of population; and there is no school-house of any kind:' 'This district has a population of 8000; the only instruction which the children receive is given to about 100 for an hour or two on the Sunday:' 'Population 1100; there is an excellent boys' school, but no means whatever of educating the girls, who are left idling all the day, and falling continually into immoral habits:' 'The population is about 12,000; almost exclusively poor journeymen silk-weavers; provision exists for the education of not more than 400 boys and 400 girls; of that number only about 200 are educated on week-days, and those in schools not connected with the Church.'

The tests which have been applied to discriminate between the educated and the uneducated are very imperfect and often deceptive. It does not follow because on a particular day a child is at school, that he remains under instruction a sufficient length of time. Education is a work of years, and few of the children of the poor are kept under instruction as long as is indispensable for the acquiring of the requisite knowledge and the formation of the necessary habits. 'In the Borough-Road School, London, there are always in attendance from five to six hundred children, and yet that number come in and go out every year, arising either from the shifting of the population or the carelessness of the parents. Now if the mass of the children are in that school for only one year, and in large country towns only about a year and a half, and in the villages not more than two years, while from that must be deducted times of absence at harvest and other periods, it is evident that the children cannot be for a sufficient time under any influence to derive the necessary benefit, so that there is a vast deal of delusion as to the extent of education in this country.' (Henry Dunn, Esq., secretary to the British and Foreign School Society, in his evidence before the Educational Committee.) On the same occasion the Rev. J. C. Wigram stated, in relation to the National Schools, that two-thirds of the scholars are constantly fluctuating, and that a master gave him a list of 15 or 16 boys who had been re-admitted above twelve times in the course of the year.

The child who can read is classed among the educated, without its being ascertained whether he has acquired such a skill in and taste for reading as will lead him to pursue his own improvement. It is well known that many who could read in their childhood have lost the ability before they have reached manhood. Mr. Wood, in his evidence before the Committee on Education, declares, 'I asked one man the other day, 'Can you read?' "Yes; I learned to read the Bible at school, but I dinna like to read it now." Another I asked respecting his reading: he said, "Yes, I can read;" I said, merely as a test, "Can you read the Bible?" He said, "No; I dinna want to read that any more." "What is your objection to the Bible?" "I read it backwards and forwards when I was at school."'

When writing is added, a less insufficient guarantee is obtained, and the only way to avoid being grossly misled by statistical reports is to rank among the uneducated all who cannot write. But even the ability to write is frequently lost, and it may be retained in connection with no small degree of ignorance.

The existing schools themselves however must be looked into in order that a just opinion may be formed of the quality of popular education. The Manchester Statistical Society, in their Report on the State of Education in York, remark, that 'however imperfect the education received at Sunday-schools may be, when compared with a reasonable or a foreign standard, it affords nevertheless the most valuable training within the reach of the great mass of the industrious population of England.' Yet this training extends only to a few hours every week, is given by persons who are generally elevated only a little above their scholars, and whose only valuable recommendation is, that they are in general animated by a benevolent and pious spirit. There are however indirect effects which abate the good of Sunday-schools, particularly in the spirit of sectarianism and bigotry which, as at present constituted, they tend to foster; the undue opinion of themselves which they are apt to engender in the minds of the teachers; the rivalry which they excite and the jealousies which they keep up between different schools; and, above all, the pauperising influence which, more than other charity-schools, they exert on the scholars. Yet are there 750,000 children in England and Wales who have no other opportunity of gaining useful knowledge. So long indeed as scarcely any other book than the Bible is employed in Sunday-schools, the training which they afford must be very defective, unapproached in its excellence as is that holy book when well understood and rightly used. But an exclusive acquaintance with it is not sufficient to expand the mind and prepare it for the duties of life. Without the aid of other knowledge it is not possible that those distinctions and qualifications should be made which parts at least of the Sacred Scriptures require, and which are rendered necessary by the lapse of ages and the existence of a totally different order of circumstances. If these distinctions and qualifications are not made, the most erroneous conclusions may be drawn from the Bible, and the most unrighteous purposes may be in appearance made to receive a sanction from it. The Scottish Covenanters justified their murders by appealing to the severities practised by the Israelites. The German Anabaptists made use of the disinterestedness of the first Christians in sharing their property with the destitute in an emergency, in order to authorise their spoliation of the goods of others. The madman Thom, alias Courtenay, appealed to the Bible in support of his delusions. Chartism flourished most vigorously, and in its most offensive form, in cases where the Scriptures were the text-book.

Indeed on inquiry it has been found, that many who have gone through the Sunday-school have, in after-life, derived little advantage from the discipline, having forgotten the scraps of religious instruction which had been presented to their memory, and out-grown the bare mechanical ability of reading, which they had more or less imperfectly acquired, perhaps lost also, because not sufficiently impressed on the character, the moral tone and influence which is nearly the only good thing of a decided nature that Sunday-schools in general effect. In regard to the result, the ensuing quotation from the third publication of the 'Central Society of Education' may be considered as representing a large class of the scholars: 'My name is Thomas Diprose. I live at the village of Ash (Kent). I went to the Sunday-school at Mospham Church for three years. Used to learn to read and repeat the Catechism. Was not taught to write. Cannot now either read or write. Have forgotten the Catechism. I think I could read a little in the New Testament, but not in any other book.' At the same time, in some schools superior influences are kept in operation with a corresponding beneficial result, and it would be very unjust to deny that Sunday-school teachers as a class possess many excellent points of character, and are deserving of high esteem, especially in a country where the love of money is the predominant passion.

The National and the Lancasterian schools—the two great instruments of daily education for the children of the poor—are not essentially dissimilar in respect of the intellectual advantages which they offer, and they labour under the serious defects which are inseparable from what is called 'the monitorial system,' the employment of which, under existing arrangements, is rendered necessary by the number of pupils, from 100 to 1000, which are placed under one master. The best qualified teacher is unequal to such a task, if anything more is to be attempted than a sort of mechanical routine. Education does not consist in movements and evolutions, with whatever precision they may be performed. The idea of monitors in these schools is obviously taken from the army, where the commander maintains discipline throughout a large body by an extensively graduated subordination of officers; but mere precision and order are not education, nor does it consist in the communication to hundreds of the will and the directions of a head, especially when, as in the case of monitors, the teacher is only a little less ignorant, a little less self-willed, uninformed, and mechanical than the taught. In such circumstances it is impossible that there should be anything which deserves the name of mental and moral training.

Instruction in these schools is for the most part confined to reading or writing and arithmetic, with occasionally a very little geography badly taught. Indeed little intellectual improvement is found to be communicated in any way. A friendly reporter, Rev. Edward Field, thus speaks of the proficiency which he recently found in the National Schools in the diocese of Salisbury: 'Arithmetic was rather a matter of amusement than of practical utility. This was particularly the case in the girls' schools. In some of these, what was called Dr. Bell's first sum, seemed to be the alpha and omega. I could not help expressing my opinion that the attempt in many cases was a mere loss of time. If it be said that a knowledge of arithmetic is of little importance to poor children, and especially to girls, surely then time need not be wasted on it. I could not but note a deficiency generally in the schoolmistresses with regard to this branch of instruction, and not the least in those who had been trained in London.' 'Much importance is attached to writing in most schools, and yet the methods of teaching it, and the progress made, were not generally satisfactory. I did not perceive generally any attempt at science or system in teaching to write.' 'Reading may be considered the staple commodity of our national schools. The same remark as before, with regard to the monitorial system, applies here, namely, that this important branch *generally* does not flourish under that system, but that in *particular cases* great proficiency is made. One great defect in schools of this kind appeared to be, that the masters or mistresses could not or would not specially instruct the monitors or pupil teachers *how to instruct*.' 'The attempts to make the children, by any particular process of instruction, understand the matters they read and learn by wrote, were few and far between. The study of grammar was rarely if ever carried far enough to show the structure of words and sentences, and the explanatory method which has produced such excellent and admirable results in the sessional and other schools in Scotland was rarely known. Indeed the want of explanation seems to be the common great and crying defect of our national schools.' 'Works of industry are not much practised or known.' 'The list of books in use was generally small.' 'The moral and religious discipline of schools is confessedly a subject of first importance; the more important it is, the more difficulty I felt in forming conclusions upon it.' 'I met with so many instances in which the Lord's Prayer only is said, with the Apostle's Creed (the latter, I am afraid, too commonly considered and used as a prayer), that this matter requires and deserves particular attention.' 'If the monitorial system fails anywhere, here is confessedly the weak point.'

That these remarks are not less applicable to the British and Foreign Schools, is made clear by the evidence given by Mr. Wood, before the Committee on Education, 1838.

Dr. Kay stated before the Educational Committee (1838)—'I once went with Monsieur Malac, member of the French Board of Instruction, to visit one example of each of the public schools in a large town of the North. We visited a National school, a Lancasterian, a foundation school, a private charity-school, and an infant school; and before leaving our house in the morning, we put down two series of questions, the first part of which related to one of the parables of our Saviour, and the second to the obligation of speaking the truth, and particularly the obligation of an oath. On entering each of the schools, we requested that the parable should be read by the children, and then we put the questions (which were perfectly familiar) to the children in the class in succession, having selected the most advanced class in each school. The questions were not answered in the National school, in the Lancasterian school, in the foundation school, or in the private charity-school, but they were all answered in the infant-school.'

By general admission, the infant-schools give the best daily instruction to the children of the poor. A less inconsiderable number of the teachers receive some training for their office. A better spirit presides over their teaching and discipline. In theory they are admirable for the most part, but their actual worth is much overrated. Few persons are more competent to speak on the point than Mr. J. R. Wood, who gave his opinion before the Educational Committee to the following effect:—

'One of the defects of the present system is the assembling so many children together, and the constant appeal that is made to their emulation; it brings them out into publicity, and there are certain children who are brought prominently forward; of course, the natural disposition of the teacher would induce him to put those who are apt and quick before the others, and these frequent exhibitions to strangers visiting the school have all an injurious effect upon the mind of the child, and also an injurious effect upon the minds of other children, discouraging and disheartening them, and the great mass are generally of the latter kind. Then I consider the generality of the lessons in infant-schools are by no means sufficiently simple; there is a great deal of what is complicated; the children learn it by rote; one child sings it after the other, and thus they have no more idea of what they learn than the children in dame-schools. The number of children is also too large for efficient moral training. No valuable education can go forward without the teachers considering the intellectual development and the particular habits of the scholars, and in these large schools that is impracticable.

'The examination into a large number of infant-schools has led me to alter the favourable opinion I once held; at the same time, I see nothing that I can suggest in the place of infant-schools; I consider therefore that infant-schools are among the most valuable means we do at present possess, with all their faults, for acting upon the education of the lower classes, and one reason why infant-schools have not effected all they might have done, has arisen from the fact of there being so many persons masters and mistresses of these schools who are totally unqualified. Infant-schools became popular under the management of two or three talented individuals; infant-schools were established, and there was an immediate demand for masters and mistresses, and persons were sent for a month or six weeks to hear Mr. Wilderspin lecture, and they came away with the worst parts of the system, the noise and confusion of singing, and so on, but the really valuable points they seemed to have left out very much, consequently the infant-schools which are scattered up and down the country are not what they ought to be, and are not conducted in the way they should be. I do not conceive the system to be by any means perfect, but it is the best means I have met with or seen in operation for the education of the lower classes.'

From the preceding review of the state of popular education in England, the inference is inevitable that, in the words of Mr. Dunn, secretary to the British and Foreign School Society Educational Committee, 1838, 'it is wretchedly deficient both in quantity and quality.' To the same effect is the opinion stated in the Report of the Chester Diocesan Board (1840):—'But if the quantity of education be deficient from the want of schools, the quality of such as is given is not less disproportionate to the legitimate demand. On this point the Diocesan Board appeals with confidence to almost universal experience. How few are those schools in which the scholars are well educated according to their several degrees; in which knowledge is so imparted as to fit them for their various duties in after-life!' The Parliamentary Committee on Education (1838), after referring for particulars to the evidence taken before them, declare,—

1. That the kind of education given to the children of the working classes is lamentably deficient.
2. That it extends (bad as it is) to but a small proportion of those who ought to receive it.
3. That without some strenuous and persevering efforts be made on the part of government, the greatest evils to all classes may follow from this neglect.

The quality of the education may be partly learnt from the fitness of the teachers. All the best authorities agree in representing the existing body of teachers, with some exceptions, as almost totally disqualified. If this be the case, our existing education must be as bad in kind as it is deficient in quantity. The substance of the evidence in this matter given before the Educational Committee of 1838 was to the following effect:—The mistresses of the dame-schools are very imperfectly instructed; they have no acquaintance whatever with any correct methods of conveying religious and secular instruction; they have no idea of the proper mode of conducting the moral and industrial training of children; they resort to the business of education from necessity, and, under the pressure of adverse circumstances, are in great poverty, and very ill supplied with books and other instruments of teaching; they have often some other pursuit, such as needlework, washing, &c., and are generally of sour tempers and severe in their discipline. Of day-schools generally it is stated that the instructors are extremely unequal to the duty; that many are only half-informed themselves; that they are persons who are unable to obtain employment elsewhere, and that the worst consequences follow to the children who are placed under their instruction. The masters are generally ignorant of the depressing and unhealthy effects of the atmosphere which surrounds them, and do not consider it desirable that their schools should be better ventilated. In the poorest schools no pretence is made to teach morals, and many masters have no idea what teaching morals can possibly mean. One master, being asked if he taught morals, answered, 'That question does not belong to my school, it belongs more to girls' schools.'

It is not unusual to find the mistress of a dame-school gone out for the day, and her school left in charge of some neighbour or neighbour's child; sometimes she is found washing at the back of the house; at other times the washing and drying are carried on in the school. 'In a garret, up three pair of dark broken stairs (in Liverpool), was a common day-school, with forty children, in the compass of ten feet by nine. On a perch, forming a triangle with the corner of the room, sat a cock and two hens; under a stump bed, immediately beneath, was a dog-kennel, in the occupation of three black terriers, whose barking, added to the noise of the children and the cackling of the fowls on the approach of a stranger, was almost deafening; there was only one small window, at which sat the master, obstructing three-fourths of the light. There are several schools in the same neighbourhood which are in the same condition, filthy in the extreme.' 'One master, who stated that he used the globes, was asked if he had both or one only. "Both," was the reply; "how could I teach geography with one?" It appeared that he thought both necessary, because one represented one half and the other the remaining half of the world. "He turned me out of his school," says the agent, "when I explained to him his error." It is thought unlucky for teachers to count their scholars. "It would," said a mistress, "be a flat flying in the face of Providence. No, no, you sha'n't catch me counting; see what a pretty mess David made of it when he counted the children of Israel."'

The masters of the day-schools were by no means sensible of their deficiency; one of them said, 'I hope the government, if they interfere, will pass a law that nobody that is not high larnt shall teach for the future; then we shall have some chance.' To the same effect is the statement of Dr. J. P. Kay, in his paper on 'The Training School at Battersea:'—'Very little inquiry confirmed what was previously suspected, that the number of English schoolmasters acquainted with the organization and discipline of elementary schools, and skilful in the application of approved methods of instruction, is exceedingly small, and by no means on the increase. Successive applications were made to those sources from which teachers are usually obtained in England, but these applications were almost invariably unsuccessful, for a variety of reasons. The attendance of the teachers trained in the model schools of the metropolitan and other societies seldom exceeds six months, and often does not extend beyond three. Experience of the motives by which the class of schoolmasters now plying their trade in this country are commonly actuated, is a graver source of want of confidence in their ability to engage in this labour than the absence of skill in their profession. A great number of them undertake these duties either because they are incapacitated by age or infirmity for any other, or because they have failed in all other attempts to procure a livelihood, or because, in the absence of well-qualified competitors, the least amount of exertion and talent enables the most indolent schoolmasters to present average claims on public confidence and support.' Insufficient however as most of them are for giving such an education as the children ought to receive, the teachers of the National and British and Foreign Schools are superior to the instructors of ordinary day and dame schools. On this point the Rev. Edward Field, M.A., Inspector of National Schools, reports (1840):—'I have pleasure in being able to report that many of the mistresses of united schools of girls and boys were fulfilling their arduous and important task with zeal, fidelity, and success. In a few instances I had to report that the masters seemed too young for their difficult and responsible duties. Some mistresses of infant-schools were sinking under the continued pressure upon their strength and spirits.' This guarded and qualified praise he is unable to extend to the teachers of dame-schools: 'Too often the rule of such schools, when any profitable instruction is given, is a harsh one, and in others the honest declaration of one dame would apply to many,—"It is but little they pays me, and it is but little I teaches them."' The following table will serve as an illustration of the extent to which the want of a previous training in teachers prevails, particularly among the poorer classes:—

Number of teachers of various classes of day and evening schools, and the number who have received any education for their employment in the undermentioned boroughs.

BOROUGH OF	Dame schools.			Common boys' and girls' schools.			Superior Private schools.			Evening schools.			Infant schools.			Endowed and charity schools.		
	Number of teachers.	Number educated for the employment.	Number not ascertained.	Number of teachers.	Number educated for the employment.	Number not ascertained.	Number of teachers.	Number educated for the employment.	Number not ascertained.	Number of teachers.	Number educated for the employment.	Number not ascertained.	Number of teachers.	Number educated for the employment.	Number not ascertained.	Number of teachers.	Number educated for the employment.	Number not ascertained.
Manchester	230	..	..	179	16	..	144	25	..	86	7	..	5	2	..	21	5	..
Salford	65	10	..	42	8	..	29	14	..	28	7	..	3	..	..	13	2	..
Liverpool	244	2	..	194	18	2	143	71	11	43	6	..	17	1	..	50	18	7
Bury	30	2	..	17	2	..	8	6	..	6	..	..	2	..	..	4	2	..
York	37	..	..	23	2	..	30	10	3	2	..	..	3	1	..	31	19	3
Total	606	14	..	455	46	2	324	126	14	165	20	..	30	4	..	119	46	10

The ignorance of the adult population is also a proof of the insufficiency of the existing means for education. In the district in Wales where Frost made his outbreak, 'of the adult population a large proportion could neither read nor write; very many had only acquired the art of knowing the letters and words, and very few could read with ease to themselves and understanding.'

'Similar investigations in other parts of the district gave similar proofs of the insufficiency in the means of mental and moral culture. These received confirmation from the representations of the few booksellers who are the medium of the regular supply of such books and periodicals as may be required by the labouring portion of the community in the two parishes of Merthyr and Bedwelty, containing together 54,000 persons. Of the seven booksellers in these two parishes, two receive little or no demand from the working classes; one has only a few second-hand books in a shop, filled chiefly with shoes; one keeps a stall in a market, to aid his sale of Welsh song-books, hymn-books, and small books for children, in which the chief part of his trade consists. The shops of the remaining three are from twelve to fifteen feet square. They all stated that they could not live by their book-trade alone. The first depended on his sale of stationary, and on the employment he obtained as secretary to several benefit societies; he said he could not pay his small rent by the sale of Welsh or other books; he was agent for three Welsh newspapers, of which he distributed, on the whole, 72 copies monthly; he also sold 62 copies weekly of English newspapers, printed in Welsh towns, and circulating chiefly in Wales. The last monthly invoice of the second contained orders on his London agent for 22 small religious periodicals, eight copies of 'Chambers's Journal,' one 'New Monthly,' one 'Monthly Chronicle,' one 'Medical Gazette,' two 'Mechanics,' eight 'Penny' and four 'Saturday' Magazines; his general orders and retail trade amounted to about 10*l.* per month. The invoice of the third for January consisted of orders for 20 small religious periodicals, 33 periodicals and small books for children, and 36 periodicals of general literature; among which the most important were, one 'Chambers's Edinburgh Journal,' four 'Taits,' one 'Mechanics,' and ten 'Penny Magazines.' There was also an order for one part of the 'Pictorial History of England.' The value of the whole, at the publishing price, including general orders, was 5*l.* 6*s.* 8*d.* These two parishes being situated in the heart of the hill district, and distant several miles from any town beyond its limits, the regular demand for books and periodicals on general subjects among the labouring population is not unfairly represented by the preceding statement.' (Tremenheere's *Report.*)

From Reports made by the Rev. John Clay, chaplain of the house of correction at Preston, it appears that of 349 men charged with felony in 1835 and 1836, 150, or 43 per cent., were altogether unable to read; 82, or 23 per cent., were barely able to read, so that two-thirds, or 66 per cent., might be considered wholly uneducated. Of 78 women, 33, or 42 per cent., were unable to read; 28, or 36 per cent., could barely read, and only 5, or 6½ per cent., could read well; four could write their names, two others could write a little, and two only could write well. His Report for 1836-7 comprehends the cases of 935 individuals charged with various offences: of these, 460 were unable to read, 212 were barely capable of reading, and not more than 18 could read and write well. The amount of religious knowledge possessed by these prisoners is very small: 466 were quite ignorant of the simplest religious truths; 821 could repeat the Lord's Prayer, but were obviously incapable of understanding its import; 12 only had any acquaintance with the principles of religion.

The ignorance does not arise from want of resources, but from the habit on the part of the workmen of devoting their earnings to objects of immediate and sensual enjoyment. The following is given as exhibiting a fair specimen of the mode in which high wages are appropriated:—

Expenditure of two steady workmen, living in their own cottages, each with a wife and four children, the eldest in both cases thirteen years of age, and helping the father:—

Collier, per Month:

	£	s.	d.
3 bushels flour, 13*s.* 6*d.*	2	0	6
8lbs. butter, 1*s.*	0	8	0
8lbs. sugar, 8*d.*	0	5	4
7½oz. tea, at 6*d.*	0	3	9
¼lb. tobacco	0	2	8
6lbs. soap, 7*d.*	0	3	6
10lbs. cheese, 7½*d.*	0	6	3
8lbs. bacon, 8*d.*	0	5	4
1lb. candles for house	0	0	7
8lbs. do. for labour, 7*d.*	0	4	8
12lbs powder for do.	0	6	6
Potatoes	0	6	0
20lbs. fresh meat, 7*d.*	0	11	8
¼lb. currants	0	0	5
Raisins	0	0	3
Blue, starch, pepper, &c.	0	0	10
Clothes and shoes, about	0	16	0
Beer	0	6	0
	£6	8	3

Furnace-man, per Month:

	£	s.	d.
3 bushels flour	2	0	[illegible]
4 pecks malt	0	9	[illegible]
12lbs. butter	0	12	
10lbs. sugar	0	6	[illegible]
¼lb. tea	0	4	[illegible]
4lbs. soap	0	2	[illegible]
6lbs. cheese	0	3	[illegible]
12lbs. ham	0	6	[illegible]
1lb. candles	0	0	[illegible]
24lbs. fresh meat	0	14	[illegible]
½lb. raisins	0	0	[illegible]
¼lb. currants	0	0	[illegible]
Pepper, mustard, &c.	0	0	[illegible]
¼lb. tobacco	0	2	[illegible]
Clothing, shoes, &c.	0	17	4
	£6	3	[illegible]

The following is taken from 'The Thirty-Fifth Report (1840) of the British and Foreign School Society:'—

'Your committee cannot conclude this brief sketch of their domestic operations, without adverting again to the evidence of the extent of popular ignorance still prevailing in England. The following statements, drawn from official sources, need no comment:—

'In the three months of July, August, and September, 1838, there were 27,670 couples married in England and Wales, whose marriages were duly registered, and copies of the registers transmitted to the General Register Office.

'Of these, the number who did not write their names but signed with a mark, was—men, 8733; women, 13,62[illegible]

'The proportion per cent. of those who signed with a mark in the whole of England and Wales, in the metropolis, in North Wales, and in South Wales, together with Herefordshire and Monmouthshire, is as follows:—

	Men.	Women.	Mean.
'England and Wales	32	48	40
Metropolis	11	25	18
North Wales	39	70	54·5
South Wales, including Hereford and Monmouth	46	56	51

'At the Marlborough sessions of October last, out

107 prisoners put on trial, 44 could neither read nor write, and 38 were under twenty years of age.

'At the Salford October sessions there were 127 prisoners charged in the calendar with felony. Of this number 53 could neither read nor write; 35 could read imperfectly; 34 could read well, and write imperfectly; and only 3 could read and write well. There were also 22 charged with misdemeanors, of whom 8 could neither read nor write, 7 could read imperfectly, and only 1 could read and write well.

'In the house of correction at Lewes, of 846 prisoners, 48 only could read and write well; 252 could read and write a little; only 8 had any idea of Christian doctrine; 294 knew nothing of our Saviour; 490 had heard of him, but knew little more than his name; 54 knew something of his history.'

Dr. J. P. Kay stated before the Education Committee, in 1838:—'I have been very strongly impressed indeed with the extreme ignorance of the poorer classes in the large towns and in the agricultural districts, especially of the south of England; and being desirous to obtain minute information on that subject, I transmitted to the masters of workhouses in Norfolk and Suffolk a circular, requesting them to give me an account of the number of adult paupers in their respective workhouses who could read in a superior manner, decently, or imperfectly, and the number who could write in a superior manner, decently, or imperfectly, for each of the respective class of paupers. I am able to present the committee with the results of that investigation:'—

Return respecting the paupers above the age of 16 *in the workhouses of the Norfolk and Suffolk Unions and Incorporations, on the* 12*th day of June*, 1837.

Description of pauper.	Number of paupers of each class now in the workhouse.	Number of these paupers who can read			Number of these paupers who can write			Number of those paupers who can neither read nor write.	Number of each class who had been in a workhouse previously to the formation of the Union.
		In a superior manner.	Decently.	Imperfectly.	In a superior manner.	Decently.	Imperfectly.		
Men:									
Able-bodied	123	2	36	10	1	14	7	68	36
Temporarily disabled	50	5	14	4	2	11	7	24	28
Old and infirm	513	12	112	58	3	69	37	307	329
Women:									
Able-bodied	355	18	95	75	3	18	27	153	167
Temporarily disabled	69	5	16	13	1	1	11	34	47
Old and infirm	349	4	53	40	0	18	16	232	243
Total	1459	46	326	200	10	131	105	818	850
			572			246			

The officiating clergyman in the parish of Haxey, in Lincolnshire, ascertained from the parish register that of each 100 persons married between 1754 and 1838, 53 were unable to write their names. During this period there had been solemnised 1008 marriages, and out of the 2016 individuals united, 933 could sign their names, 1083 could not. If from these 983 there are deducted the names of the gentry, professional men, and shopkeepers, there remain not more than one-third of the peasantry in a condition to give so simple a proof of education as signing their names.

The deficiency which has existed in the school-education of the poor is now found to exert an injurious influence on even the most popularly constituted of the mechanics' institutions. For want of good early training, the young men for whom these establishments are designed, are indisposed and unable to derive from them all the advantages which they are fitted to convey. Such of the opportunities of improvement which they offer, as require little effort of mind and little attention, those which appeal chiefly to the senses, and afford immediate pleasure—lectures on certain subjects, music, tea-parties, recitations, &c., are sought after, while little attention comparatively is given to the studies which the classes are intended to carry on in grammar, arithmetic, mathematics, and science generally. As might be expected under these circumstances, the support given to these institutions is fluctuating and uncertain. At the commencement of each quarter there is a rush of subscribers; the librarian is oppressed with applications for books, the classes fill, the supply of newspapers is deficient. Scarcely a month passes when there is 'room and range enough,' especially in the class-room. In addition to this, each quarter nearly two-thirds are new members. Many of those who leave return after an absence of three or six months; but very few remain long connected with the institutions. In the library, works of fiction are chiefly in demand; even poetry is little in request, and scientific books generally remain quietly on the shelves.

The true *Theory of Education* can only be developed by considering what the being is on whom it is designed to operate. Education is, according to its etymology, the leading out or unfolding of the human powers. It is obviously therefore a means for a certain purpose. To learn what that purpose is we must refer to experience, and we must investigate the capacities of the human being. These being ascertained, it follows that education is, in any particular case, an instrument for developing them. Now we know that man has not only physical and intellectual, but also moral and spiritual faculties, all of which education ought to take under its care. That education is incomplete which neglects any one of these faculties; and that education discharges its functions imperfectly which does not cultivate the faculties in such degree that their action may be well adjusted, and their general working be harmonious. But if there appear to be any one of the faculties apart from whose influence the rest work indifferently or produce baneful results, and which is found when in healthful vigour to strengthen, refine, and control the whole nature, this power ought to receive primary and chief attention. The work then of education is to foster, strengthen, and raise the physical, intellectual, moral, and spiritual capabilities of man. Some important deductions flow from these principles. Education ought to be universal both in relation to each individual and the community at large; for it ought to be co-extensive with the capabilities on which it is intended to act. It is contrary to the constitution of man and to the designs of God for any one of our capacities to remain undeveloped. They err who neglect to educate the body, and they also who neglect to educate the mind. These errors represent two different classes of men. A certain school of philosophy at least makes light of religious education; physical education has been lamentably neglected by the recognised teachers of religion. The latter error is now disappearing, but the former has been gaining ground; and this error is the more to be deplored because its consequences must be serious and lasting. If any one, certainly the religious faculty may be considered as the moving-power of the human being. Religion indeed rightly understood is the central science, round which all other branches of knowledge and all other pure influences are grouped, towards which they gravitate, and from which they receive their light, their heat, and their highest value. But for the peculiar political circumstances of England, any system of popular education which omitted direct religious culture would probably have been considered by thinking men as defective. The difficulties which stand in the way of an adjustment of conflicting claims may be numerous and great, and they may account for the diffusion of the mistake in question; but no difficulties can excuse, much less justify, a departure from truth. Principles must be steadily asserted under adverse as well as favourable circumstances, and the result will at last prove far more satisfactory than anything which can ensue from expediency. Religion in education is all-important and indispensable, nor must the friends of a progressive civilization be deterred from proclaiming the fact by any apprehension that it may in some respects be turned to a bad account.

There is in truth no other way than that which is afforded by a religious training for forming such a character as the trials and duties of life require both among the rich and the poor. The mere communication of knowledge, and even habits of reflection and inquiry, can do very little towards real happiness. What the people want is true wisdom and moral power, without which life is a scene of conflict and misery; but wisdom and moral power are the peculiar gifts of religion.

Morality therefore should be taught in the schools in connection with the sanctions of religion. Apart from religious influence morality may direct but cannot control. Morality may enlighten and it may enjoin, but of itself it is powerless to govern; it is preceptive, not impulsive, pointing out our path, but not urging us on to pursue it. Now it is power rather than knowledge that man wants; and all genuine power for moral purposes has its source in religion. It may be well to remember that these distinctions of morality and religion are factitious and arbitrary; they are not recognised in the records of the Christian revelation; they find no authority in the human mind. Religion includes morality, or rather, is morality as well as religion, comprising in itself whatever is necessary for man to know, do, and be, whether in this state or the next, in order to fulfil the divine will, to perfect his character, and work out his highest good. Consequently, he that is well trained in the knowledge and practice of the Christian religion has received both a moral and a religious education, and is fitly prepared for the duties of life.

From this it will be seen that the religious education here demanded is not of a dogmatical, much less a sectarian kind; but such instruction as may enlighten the mind of the child and the adult as to their capacities, their duties, and their hopes; and such a discipline as may work the instruction into the character till it 'leaven the whole lump.'

It is not a little curious that in regard to education we may take a lesson from the antient Persians,* who, according to Xenophon, removing education from the hands of the parents into the hands of the state, gave the same attention to the moral training of the young as is now under the best circumstances given to their intellectual instruction, and so brought them up under the influence of precept and example, that the state was saved from the painful necessity of inflicting punishment, in consequence of having taken such preventive measures as relieved the youth from the desire of what is low and unjust. Morals with them were a practical science, the principles of which were first taught by word of mouth, and then by actual examples and by daily practice.

The morals taught in primary schools should have a regard to personal, domestic, and social duties, or the obligations which an individual owes to his family and to the state. The instruction should consist not of a mere dry detail of precepts, but should appeal to the reason and affections, that it may both develop them and gain such a reception in the breast of the scholar as to become the living power which governs his conduct. It is strange that a subject such as moral instruction and training, which is of paramount importance, should hitherto have been almost neglected in the education of the children of the poor. Nor is it much less strange that the nation should have passed through dangers and difficulties of no insignificant kind within the last half-century, suffering so little from outbreaks on the part of a population who had never been instructed in their social duties.

The preceding remarks lead also to the conclusion that the culture which ensues from education is in itself an end, if indeed it is not the primary and great end of education. The husbandman sows the seed in order to produce grain; the educator disciplines the faculties that he may bring them into vigorous, healthful, and pleasureable activity. In both cases there is an adequate end, a result in which the agents may satisfactorily rest. Education can have no higher object than the creation of happiness by means of the formation of character. This is the great object of the Deity himself; and if even the power which education gives is regarded as an instrument, as a means to some outward result, still the pursuit of mental and moral culture as a good in itself, can have no other than a beneficial result. It is important therefore that the purposes for which education is sought should be placed and kept in their proper rank. That which is secondary must not, however good, be thrust into the first place; and above all that must not be altogether lost sight of, which in reality is in itself a most important result, if not the great end of education. The formation of character then, to make (so to speak) true men and women, beings with their faculties complete, and, in consequence, with all their internal sources of happiness, entire, full, and active—this should be an object carefully studied and diligently pursued by the educator. But here even superior minds halt behind the truth, making the chief object of education some extrinsic result—such as in the case of males, fitness for the duties of their station in life; in the case of females, such as may prepare them to be pleasing wives and useful mothers—aims excellent in themselves, but scarcely entitled to hold the first rank, if for no other reason than this, that an outward accomplishment does not of necessity imply such an inward culture as will ensure health and vigour of character, and that durable and growing happiness which attends on genuine personal excellence.

The real nature of education considered as an instrument may also be gathered from these remarks. If the subject on which education operates is mental and moral in its character, and the effects which it labours to produce and the aims which it ought to pursue, also mental and moral, the instrument must be of a similar kind. Setting aside then so much of it as is designed for a physical result, education is a mental and a moral influence: in other words, it is mind acting on mind; it is a superior acting on an inferior character; it is human thought and human sympathies brought to bear on kindred elements in the bosoms of the young; it is the power of religion living and breathing in one soul going forth into another, and kindling within that other corresponding vitality. Whence it is obvious that much of what is called education does not deserve the name; that mechanical routine is not education, nor dexterity of hand, nor skill in shaping certain forms, nor the utterance of articulate sounds. If so, then reading, writing, and arithmetic, how well soever they may be taught, ought not to be dignified with the name, though they may in favourable circumstances contribute something to education. It is equally clear that no genuine education can be imparted by one educator to large numbers of pupils of different ages and different capacities assembled together in the same place. Little can be done except each scholar comes in immediate contact with the educating mind. From that mind each pupil must draw the power which will quicken and call forth his own powers; and to determine how, in the case of the education of the children of the poor, this communication is to be secured, ought to be an object of paramount importance.

The tenor of these observations has determined another thing, namely, what ought to be the prevailing spirit and the discipline of a school. School in reality holds the place of home; home is God's school, but since present modes of life do not permit the parent to give his child a sufficient training, he transfers education to the school. The school therefore should approximate as closely as possible to home. Now in theory the homes of this land are Christian homes; the school in consequence should be a sort Christian home. Such a union of terms calls up in mind ideas of gentleness, forbearance, and affection. These then are the moral qualities which ought to prevail in the school. If so, severity and harshness must be banished as incompatible with the objects for which schools are instituted. Nor are they only incompatible, but they are actually preventive and subversive of those objects. The display every moral quality produces its like in those who habitually witness it: and unless the aim in school-training is to produce a severe, harsh, and unloving character, severity and harshness must be studiously avoided.

So also the intellectual influence employed should be such as is likely to call out and strengthen the mental powers. The chief good of education is not to be looked for in outward results, nor even in the amount of knowledge communicated, but rather in such habits of mind power to fix the thoughts on any given object, to comprehend many particulars at one view, to resolve a complex subject into its component elements, to endure lengthened exertion, to carry determinations into practice, to find resources for thinking and for happiness within—as may fit a young person for discharging his duty under all circumstances. Mere instruction therefore is not education, but simply an instrument of education. The aim should be so to inform the mind, as by the very act of informing to develop and strengthen its powers. The instruction then that deadens the appetite for knowledge and overloads the powers is not education, but something foreign to its nature.

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* Not that we suppose Xenophon represents a real state of society; but the opinions are just as valuable as if he did.

There are two modes, corresponding with two processes, by which the mind carries on its own education, namely, synthesis and analysis, which should be studied and employed by the educator as his great instruments. By synthesis he will, both orally and by means of manuals, offer knowledge to the mind in a simple, attractive, yet systematic form, rising by degrees from the more to the less easy, and from the simple to the complex. By analysis he will lead the child to decompose the matter of instruction which he has received, to trace out the relations of the several portions to one or more elementary principles, their connections with other branches of knowledge, and the more obvious deductions which may be made from them. Thus will he at once ascertain that he has succeeded in communicating his lessons to the pupil, and in making those lessons themselves prolific in additional information.

In the employment of these instruments the educator must be careful to follow nature in her order of unfolding the faculties; he must address those first which appear first, and he must carefully abstain from anything calculated to force any natural power into premature activity, or to overwork any faculty when it has come forth. Now the sight, the hearing, and the touch are the gifts of nature which are earliest developed. The power of reflection comes at a later period, and only as a result of the operation and influence of the senses. The mind of a child is an empty storehouse; the eye, the ear, and the touch are the portals through which this storehouse is supplied with matter, which, received and laid up, is afterwards operated upon by the mind, pursuant to its own laws. If then the senses are the first of our faculties which are fit for use, the senses should receive the earliest attention of the educator. A child can immediately observe; therefore the power of observation should be first cultivated. It is important that all the senses should receive cultivation, not merely for the information of which they may be made the vehicle, but also with a view to that training which is first among the purposes of education; but the eye may take some precedence, as the sense of sight comes first in the order of natural sensibility. At a very early period the educator should begin to teach his scholar how to use his eyes and other senses, both by words and by examples; and as the other faculties are found to expand themselves, so should they be from the first taken under his fostering care, that by exercise he may bring them to act harmoniously and efficiently.

It is however necessary that education should be also regarded as a means to some outward result, and here at once the social distinctions of life present themselves to our attention and modify our views. It is obvious that a child should learn that which will best prepare him for the labours, the trials, and the duties through which he will have to pass. In other words, the children of the poor ought to be taught what most concerns them to know, what they will have immediately to do, and what, other things remaining the same, will prove the most fruitful source of happiness. At the same time, the primary object of education,—the formation of character,—should also be kept in view; and the discipline through which a child ought to be conducted and the subjects of knowledge to be placed before him, must be determined by a joint reference to his capacities and his probable future station in life.

Now in treating of the mere external parts of education, health of the body is the first thing that demands our attention. The body is the instrument by which the mind executes its purposes, and by which therefore much of the good which education does, makes itself felt. It would consequently seem to be of the first importance that this instrument should be kept in the highest state of efficiency. But this is an end which cannot be attained if men are brought up in total ignorance of the structure of their bodies and of the laws of health. From the first therefore children should be habitually taught to know the conditions on which health depends; such as relate to the state of their dwellings, the condition of their persons as to cleanliness and other matters of the like kind, of which not only the labouring classes, but many others are extremely ignorant. Yet knowledge of this kind possesses no place hitherto even among the plans which have been propounded for improving popular education. There is no peculiar difficulty in communicating the requisite knowledge, and on the part of the young the reception of it would be easy and pleasant. If we measure knowledge by its real usefulness, that is, its power to promote happiness, what comparison is there between this information and a knowledge of geography, history, or other things of the kind? A man may be ignorant of all these matters, and yet live a virtuous, happy, and long life, but he cannot with impunity remain ignorant of the laws of health. The most absurd and the most injurious prejudices prevail on this point among the people; and in general they imagine that sickness, disease, and death depend on causes altogether beyond their reach, on luck or chance, and that they have no other resource than passive submission.

It is also by means of the body that the children of the poor will have to get their bread. They should be taught to know this as a fact, as a simple piece of information, which involves neither merit nor demerit, neither honour nor dishonour. For such exercises of the body as they are likely to be called to, they ought from an early period to be prepared while at school by an industrial training.

This remark comprises much more than a demand of bodily labour from the young. It involves such a course of instruction as may best prepare them for their future occupations. There is no pursuit in life—not even that which is most mechanical—which does not depend on, or is not connected with certain principles; for all manual labour is only the carrying out and realization of results for which science has prepared the way. It is equally certain that there is no labour which may not be lightened or relieved by knowledge. A good education therefore would make the labourer acquainted with the facts and principles on which his art is built; and thus enable him to enjoy the rational and sustaining pleasure of working understandingly, with a view to a given result, and labouring therefore in a manner fitted to improve his character as a man as well as his efficiency as a workman.

But no improvement can be expected in popular education until a better race of teachers is provided. Great as is the deficiency of schools, yet if they were filled with competent instructors, the chief evil would be remedied.

In the houses too of the working classes, particularly in the manufacturing districts, a change is most desirable. Whatever time may be occupied in school duties, there are many hours which a child spends during which the educator has no influence over him; and these are the very times which the young are most susceptible of impressions; when the moral and intellectual capacities open to surrounding influences, and receive them readily and retain the impression deeply. In the actual state of things then, the real educators of the young are their parents, their brothers and sisters, their playmates, their casual companions—in one word, their home. And what must that home be for moral or for intellectual instruction, from which the mother is absent the greater part of her time, being occupied in the factory from five in the morning till six or seven at night? Another mother is indeed at home (a rare case), but she has from her girlhood up to her motherhood been trained in a factory, and knows scarcely anything of good housewifery, and still less of the moral obligations under which she stands to her children. The children themselves also are sent to the factory to work long before they could under any system have received a proper training. But they soon earn enough to make them feel independent of their parents, who, having perhaps for years derived the chief means of supporting the family from the earnings of three or four elder children, have become idle, lost their character, and have now to struggle with these elder children for the maintenance of their own authority, instead of being, at the most critical period of their lives, their guides and friends.

No small part of these evils results from the employment of females in mills and factories; nor can they be effectually removed by any other means than an act of the legislature, which should prohibit such an occupation to females altogether, or at least to the mothers of families. Great would be the change effected in hundreds of families which are supported by factory labour if such a law were to pass, and if it were accompanied by an efficient system of education for females of the working classes. In the ordinary state of society all that should be peculiar in a female's education would be left to her mother. But among a large part of the manufacturing classes there are not mothers who could give anything approaching to the requisite education. There is then no other resource but the school. It is altogether impossible that the labouring classes, at least of the manufacturing districts, can ever be happy until a new and improved race of mothers appears. In addition therefore to the educational requisites already mentioned, it is necessary that there should be a sufficient number of girls' schools in which the ordinary arts of domestic life—baking, brewing, cooking, sewing, knitting, making and mending, should be taught; in which the children should be trained to personal neatness and propriety; to command their temper, to regulate their passions, to know and feel the importance of their actual and their coming duties. And since it is obvious that the mind of a child cannot understand many of the duties of women, there should be institutions to receive the children when they leave the school, institutions so ordered that their hours and discipline may be suited to young women engaged in and destined for manual labour; and presided over by matrons whose character would be a guarantee that all would be done to instruct and train their scholars for their future duties, whether as domestic servants or mothers of labourers' families. This matter is of vital interest to the working man, and therefore to the country, for it matters little what the labourer's earnings are, what his own intelligence is, if he has not a thrifty, kind-hearted, sensible, and industrious wife.

Among the changes desirable on the part of the parents is the existence of a disposition to provide out of their own resources suitable means for the education of their children. That it is their duty to make this provision when they have the power is unquestionable; and although it is too much to expect at the present, yet something may be done towards it, and the complete fulfilment of the claim may be looked to as an ultimate end. There is nothing but their own exertions which can bring to the labouring classes all the good which education can convey. The charity of education, like charity of every kind, tends to pauperise those whom it aims to benefit: and so long as the education of the poor depends on the efforts of rival and conflicting parties in religion or in politics, it is impossible that the power thus gained should not be used in order to further the opinions and interests of the several factions. In the meantime the people are regarded and treated as instruments for a purpose, and their education is shaped and varied not by a regard to what is absolutely best, but to what is conducive to the ends of the party which directs it. It is true that some good has resulted from the efforts of individuals and societies by which such education as the poor have received has been conducted during a century. It is equally true that these voluntary exertions have in many cases sprung from pure and enlarged benevolence. Still they could not under the circumstances fail to be accompanied by a large amount of sectarian and party feeling. At the present hour this is peculiarly the case. The church is arrayed against dissent, dissent is arrayed against the church, in competition for the largest share in the education of the children of the poor; and the rivalry is in greater or less activity through every city and village of the kingdom.

The magnitude of the evil and of the interests which are at stake seem to demand the intervention of the government by means of a general catholic and truly national education. But the conflict of parties gives little reason to expect this at present. Still the government is doing something; but the remedial measures employed cannot overtake the disorder. Perhaps after all, the end to be aimed at is, that the people should seriously take the education of their children into their own hands, or entrust it to proper persons of their own choice. This end may be facilitated by that love of independence which has hitherto been a marked feature in the character of Englishmen, who do not like either a government or individuals to be obtruding on their private concerns.

Nor are the pecuniary means of the poor altogether insufficient for this important object. Exceptions at present must be made for large classes of workmen, but in general there are comparatively few families in which, with a wise economy, something could not be spared for education. If however the principle of association could be brought into operation in connection with education, the difficulties would be much diminished. Already there are self-supporting dispensaries—hospitals for the body, why not self-supporting nurseries for the mind? As it is, the poor now pay in the large towns (see table, p. 41) nearly the same sum of money for a bad education for half the children, which under proper arrangements would secure an excellent education for all their children. Let us suppose popular schools to be established, each containing one hundred children; and that each family supplies two scholars. Fifty families would constitute a school-union. The several unions in each neighbourhood might be formed into a district-union, the district-unions formed into county-unions; the county-unions into one grand national-union. Let sixpence a week be, by the laws of the union, paid for each child, and an income is secured for each school of 130*l.* per annum. For the guaranteed salary of 130*l.* a year, a competent master would in time be obtained, who should be required to procure an assistant. School-rooms and school apparatus might be supplied by the state either as a gift or by loans. Then there are the rooms in which Sunday-schools are taught, the greater part of which are left unoccupied during 160 hours out of 168 of which every week consists. With the aids that would present themselves, the people in the larger towns at least could, without serious difficulty, provide school-rooms for themselves in time, if they did little more to repay loans than lay up the savings which would ensue from their making use in each district of their own school-room in which to transact the business of their existing clubs and unions, instead of resorting, as they now generally do, to the public-house, where all have to pay a rent, not the less exorbitant for being mostly indirect, and where many barter away their resources and their character for present gratification, to be followed by future pain to themselves and their families.

One sign of the interest which the people are beginning to take in the education of their children appears in the proposal which has lately been made, and partly indeed responded to, in an excellent pamphlet by Lovett and Collins, 'written in Warwick Gaol,' entitled 'Chartism, a new organization of the people, embracing a plan for the education and improvement of the people politically and socially.' The main objects of this publication are thus set forth:—

'To erect public halls or schools for the people throughout the kingdom, upon the most approved principles, and in such districts as may be necessary. Such halls to be used during the day as infant, preparatory, and day schools, in which the children shall be educated on the most approved plans the association can devise; embracing physical, mental, moral, and political instruction; and used of an evening for public lectures on physical, moral, and political science, for readings, discussions, musical entertainments, dancing, and such other healthful and rational recreations as may serve to instruct and cheer the industrious classes after their hours of toil, and prevent the formation of vicious or intoxicating habits. Such halls to have two commodious playgrounds, and where practicable a pleasure-garden attached to each; apartments for the teachers, rooms for hot and cold baths, for a small museum, a laboratory and general workshop, where the children may be taught experiments in science, as well as the first principles of the most useful trades.

'To establish in such towns or districts as may be found necessary, normal or teachers' schools, for the purpose of instructing schoolmasters and mistresses in the most approved systems of physical, mental, moral, and political training.

'To establish, on the most approved system, such agricultural and industrial schools as may be required for the education and support of the orphan children of the association, and for instructing them in some useful trade or occupation. To establish circulating libraries, from a hundred to two hundred volumes each, containing the most useful works on politics, morals, the sciences, history, and such instructive and entertaining works as may be generally approved of. Such libraries to vary as much as possible from each other, and to be sent in rotation from one town or village in the district to another; there to be placed in the hands of a responsible person, to be lent out according to the rules, and after a stated time forwarded to the next district.

'To print, from time to time, such tracts and pamphlets as the association may consider necessary for promoting its objects, and when its organization is complete, to publish a monthly or quarterly national periodical.

'To offer premiums, whenever it may be considered adviseable, for the best essays on the instruction of children; for the best description of school-books for infants, juveniles, and adults; or for any other object promotive of the social and political welfare of the people.

'To appoint as many missionaries as may be deemed necessary to visit the different districts of the kingdom, for the purpose of explaining the views of the association, for promoting its efficient organization, for lecturing on its different objects, for visiting the different schools when erected, and otherwise seeing that the intentions of the general body are carried into effect in the several localities, according to the instructions they may receive from the general board.

'To devise, from time to time, the best means by which the members in their several localities may collect subscriptions and donations in aid of the above objects, may manage the superintendence of the halls and schools of their respective districts, may have due control over all the affairs of the association, and share in all its advantages, without incurring personal risk, or violating the laws of the country.'

In order to effect these important purposes, it is proposed that a national association should be formed, and on the supposition that as many persons would join it as signed 'the national petition,' namely, one million two hundred and eighty-three thousand, each subscribing a penny per week, or one shilling a quarter, an annual sum would be produced of two hundred and fifty-six thousand six hundred pounds. This amount would enable the association to effect every year the following important objects:—

To erect eighty halls, or normal or industrial schools, at 3000*l.* each	£240,000
To establish seven hundred and ten circulating libraries at 20*l.* each	14,200
To employ four missionaries at 200*l.* per annum	800
To circulate twenty thousand tracts per week, at 15*s.* per thousand . . .	780
For printing, postages, and salaries . .	700
	256,480
Leaving for incidental expenses .	120
	256,600

The plan, though somewhat immature in its details, is presented in such a manner as to show that it is not a hopeless thing to expect that the working classes will make provision for the education of their children, and it proves that by very small individual efforts they can effect objects of the greatest importance.

In giving a brief notice of what has recently been done for the improvement of education in England, the efforts of government claim chief attention. These efforts have proceeded on the principle of stimulating and expanding the agencies which are already in existence, rather than of supplying the means for establishing a general and uniform system of education, under the control of the state. For several years past, grants of 20,000*l.* per annum have been made by parliament, and distributed chiefly through the National and the Lancasterian schools, in furtherance of education. The following are the chief regulations made by the 'Committee of Council on Education,' as given in a document ordered by the House of Commons to be printed, Oct., 1840. The sum to be disbursed was 30,000*l.* Every application for a grant is to be made in the form of a memorial, addressed 'To the Right Honourable the Lords of the Committee of Council on Education.' The right of inspection will be required by the Committee in all cases: an arrangement has been made by which the Established Church, through its spiritual head, the archbishop of Canterbury, concurs with this regulation: the inspectors will not interfere with the religious instruction, or discipline, or management of the school, it being their object to collect facts and information, and to report the result to the Committee in council. Before any application for aid is entertained, the Committee require to be satisfied, by reference either to the Inspectors or to the National or British and Foreign School Society, that the case is deserving of assistance, that there are no charitable or other funds or endowments which might supersede the necessity of a grant, that the site of the school-house has been obtained with a good legal tenure, and that, by conveyance to trustees, it has been duly secured for the education of the children of the poor; that it is reasonable to expect that the school will be efficiently and permanently supported. In the buildings not less than six square feet are to be provided for each child. Recipients of grants must bind themselves to submit to an audit of their building account, and to furnish reports of their schools. For every 10*s.* to be granted by the Committee, the means of educating one child at least must be provided. If any school is not in connection with either of the Societies before named, the Committee will not entertain the case, unless some special circumstances are exhibited 'to induce their lordships to treat the case as special.'

The aid of the State is thus confined, so far as it concerns pecuniary means, to giving assistance in building new school-houses; but, indirectly, other important advantages will ensue from it. The inspectors are instructed in the case of schools which they are invited to visit, to offer advice for their improvement; to give encouragement to no plan of education in which intellectual instruction is not subordinate to the regulation of the thoughts and habits of the children by the doctrines and precepts of revealed religion. 'The reports of the inspectors are intended to convey such further information respecting the state of elementary education in Great Britain as to enable parliament to determine in what mode the sums voted for the education of the poorer classes can be most usefully applied. With this view, reports are to be made on the state of particular districts, and how far the interference of government or of parliament can be beneficially exerted by providing additional means of education.' 'Acting on the principle of assisting local exertions, the Committee of Council have prepared (and published) a series of plans of school-houses, in which are exhibited those improvements which are suggested by an extensive comparison of the results of experience,' accompanied by 'specifications, working drawings, and estimates, as well as forms for making contracts with builders, &c.'

The aid thus given by the State has produced beneficial results. The grants made by the Committee of Council since 1839, amounting to 56,000*l.*, have been expended in the erection of schoolrooms, the outlay for building which amounts to nearly 190,000*l.*, the surplus beyond the grant having been supplied by private benevolence. By these means school accommodation has been acquired for 300,000 children. The government inspectors have been welcomed in every county into which they have been sent. In England, besides the schools which have been aided by public grants within these two years, 380 schools have recently invited inspection.

The National Society has of late assumed a degree of vigorous activity which promises to lead both to the extension and to the improvement of elementary education. The chief instrument to effect these purposes has been the establishment of Diocesan Boards, whose object in each case 'is to awaken a disposition in the rich to impart bountifully, and in the poor to receive gratefully, the means of education; to impress on wealthier places the duty of assisting others; and to provide that the instruction given shall be of a proper kind, and shall include an elementary knowledge of all the principles necessary to prepare the young as well for time as for eternity.' An inspector for the diocese of Salisbury, and one also for the diocese of Chester, have been appointed; several other dioceses 'desire to participate in the advantages of this measure.' Training-schools have been established in some dioceses, and others are preparing to establish them. The Diocesan Boards give attention to educational statistics. Some of them appropriate a part of their funds to the erection of school-houses; others assist in increasing the salaries of teachers and improving the routine of schools. Extending their care beyond the labouring classes, the Diocesan Boards intend to establish schools ('Middle Schools') for the children of the commercial and middle classes, and have already made some progress.

Something has been effected for the improvement of the system of mutual instruction which is universally employed in the Bell and Lancasterian schools, by the introduction, in a few instances, of the educational improvements commenced by John Wood, Esq., and detailed in his 'Account of the Edinburgh Sessional School,' the great merit of which consists in the tendency they have to make the processes of instruction an intellectual discipline, as well as a pleasurable occupation, by means of judicious methods of tuition and suitable moral influences. A more recent improvement, and one more fitted for large numbers, is found in what is termed the 'mixed method,' a method which combines simultaneous instruction on the part of the master with the mutual instruction conducted under his supervision by the scholars themselves; and in some instances efforts are made by means of instruction given out of school-hours to the better pupils, to train up a less insufficient class of assistants.

The most important results may be anticipated from the enlightened spirit with which Dr. J. P. Kay, secretary to the Committee of Council on Education, presides, under the direction of that council, over the changes that are in progress. Among his many efforts, those which he has made to provide a suitable education for the pauper children of the country, amounting in number to 56,835 under sixteen years of age, are of great moment, not only for the direct good which they will effect for a neglected class, but also for the impulse which the improvement of such a class must give to education in general. Most valuable information as to what is being done, as well as to what is needed, is contained in 'Report to the Secretary of State for the Home Department, on the Training of Pauper Children,' 1841. The volume comprehends a full account of what has been accomplished, and of what is attempted in the Training School at Battersea near London, established and for the most part hitherto supported by Dr. Kay and Mr. Tuffnell. The work should be in the hands of every friend of popular education, as presenting the results of inquiries made in the best popular schools on the Continent, and particularly

Daily Routine.

		Monday.	*Tuesday.*	*Wednesday.*	*Thursday.*	*Friday.*	*Saturday.*
½ past 5	Rise, wash, dress, and make beds.						
¼ to 6	Household work, viz. scouring and sweeping floors, cleaning grates, shoes, knives, &c., pumping water, and preparing vegetables.						
¼ to 7	March into garden, and commence garden-work, feed pigs, poultry, and milk cows.						
¼ to 8	March from garden, deposit tools, and wash.						
8	Reading of Scriptures and Prayer. (In the spring, half an hour was commonly occupied in a familiar exposition of the passage of Scripture read.)						
After Prayer	Superintendents present reports.						
½ past 8	Breakfast.						
9 to ½ past 9	Classes united	Reading in the Bible and religious instruction. Old Testament History.	Reading in the Bible and religious instruction. The Gospels.	Reading in the Bible and religious instruction. The Acts of the Apostles.	Reading in the Bible and religious instruction. The Epistles.	Committing to memory texts of Scripture.	Committing to memory texts of Scripture, or examination on the Scriptoral reading of the week.
½ past 9 to ½ past 10	1st class	Mechanics	Arithmetic.	Mechanics.	Arithmetic.	Mechanics.	Weekly examination.
	2nd class	Arithmetic	Mechanics.	Arithmetic.	Mechanics.	Arithmetic.	
½ past 10 to 11	1st class	Mental arithmetic.	Etymology.	Mental arithmetic.	Etymology.	Mental arithmetic.	
	2nd class	Etymology.	Mental arithmetic.	Etymology.	Mental arithmetic.	Etymology.	Ditto.
11 to 12	Classes united	Geography.	Geography.	Music.	Geography.	Geography.	Music.
12 to 1	Garden work, feeding the animals, &c. &c. March to the house at 1, wash and prepare for dinner.						
½ past 1	Dinner.						
2 to 3	Classes united	Mechanical Drawing.	Map Drawing.	Mechanical Drawing.	Common and Isometrical Perspective.	Map Drawing.	Weekly examination.
3 to 4	1st class	Algebra.	Use of the Globes.	Mensuration.	Use of the Globes.	Algebra.	Ditto.
	2nd class	Grammar.	. .	Algebra.	. .	Grammar.	
4 to 5	1st class	Natural History of Birds.	Grammar	Object Lesson.	Grammar.	. .	Ditto.
	2nd class	Do.	Committing to memory arithmetical tables and rules of grammar, or mechanical formulæ.		Committing to memory arithmetical tables and rules of grammar, or mechanical formulæ	Committing to memory.	
5	March to garden work, feed pigs, poultry, &c., and milk cows.						
6	March from garden, wash, and prepare for supper.						
½ past 6	Supper.						
7	Drill and gymnastic exercises.						
8	Copying music or notes on geography, or mechanical formulæ in the upper class-room. During this period the History of England is read aloud. Another class practising singing in the lower class-room.						
9	Reading of Scripture and Prayer.						
20 minutes past 9	Retire to rest.						

Sunday.

After divine service one of the sermons of the day is written from memory. In the evening the compositions are read and commented upon, and the catechism or some other portion of the formularies of tho church is repeated, with texts of Scripture illustrating it.

Some of the elder students teach in the village Sunday-school.

as presenting the best of what has hitherto been effected for supplying a well-trained class of teachers. The design is to educate—1, preparatory classes of students and pupils; 2, a class of candidates; 3, a class of scholars. Pupils of the first class are examined at the end of the first year, and if approved, receive a certificate as candidates of the training-school: the candidates who make due proficiency pass at the end of the second year into the rank of scholar; and in their turn, the scholars in the third year, on evincing suitable improvement, receive the certificate of master. Hitherto the training-school has not passed the preparatory stage; the routine for the classes in this stage is given in the preceding table.

Similar tables for the education of the more advanced classes, as conducted in Continental schools, are given in the book; in which tables, among other points worthy of commendation, two subjects of instruction deserve special mention: 'The means of improving the health and condition of the people;' 'Instruction in the law and duties of a citizen.' Not only however is the range of instruction in the school at Battersea commensurate with the duties for which the young men are training, but the methods pursued are no less effective than new in relation to the great branches of instruction which now constitute and those also which ought to enter into the elementary education of the country. The religious department appears to be conducted in the least satisfactory manner. Hitherto no sufficient evidence appears that those who are likely to give the tone to popular education in England are impressed with the necessity and convinced of the practicability of making that education a medium for instructing the people in the laws of health and their rights and duties as citizens.

Prussian Schools.—The following remarks on the Prussian Schools are inserted here for the purpose of enabling a person to contrast what has been done in that country with the state of education in this country. It is a fact generally admitted by all competent judges, that the system of public education established by the Prussian government is the most complete and most efficient in Europe. The advantages which the people derive from the Prussian system arise not only from the large amount of knowledge which is diffused, but also from the circumstance that a portion of this knowledge has reference to the future pursuits of the pupils. In the system of instruction in this country, the latter object is hardly ever kept in view, and the education given in the British schools in general has no reference to actual life. In Prussia parents choose a school for their children, with a view to prepare them for the pursuits which are to form their future occupation. As soon as the boys have acquired the rudiments of knowledge, the parents determine what shall be their business in life, and by this decision determine their choice of the school in which the education of the boys is to be finished. In all the schools, not excepting the elementary schools in the country, a portion of the instruction is of a general nature, but those branches of knowledge are always taught which have reference to the future destination of the larger part of the pupils. Bearing in mind this arrangement of the Prussian schools, the whole system of instruction will be duly appreciated.

In comparing the English universities with those of Prussia and of Germany in general, the difference is most striking. The Prussian universities are institutions erected by government for the purpose of providing fit persons for the several duties which devolve on the officers of administration. These institutions are subjected to frequent changes, in order that they may meet the demands of the government and the necessities of the times. In Prussia the whole body of the clergy, the judges, the magistrates, the physicians and surgeons, are considered as officers of government. All must be licensed, in order to be able to practise their profession, and the greater part of them are appointed to places by government. Thus the government has erected and maintains the universities for the purpose of giving an opportunity to all persons of acquiring the requisite knowledge for the performance of the duties incident to the various branches of administration. The universities of Prussia therefore are not institutions in which only general knowledge is to be acquired; they are schools of divinity, of jurisprudence, and of medicine. The professors who teach the sciences and arts belonging to these three great divisions or faculties, are considered as constituting the university, and the professors of philosophy or of arts are only an appendage to it. Every student must enter into one of the three principal faculties; by doing which he acquires a claim on government, after the termination of his studies and the customary examination, if he desires to be employed as a clergyman, judge, or physician. There is indeed always a small number of persons who are considered as belonging only to the faculty of arts, who have no other object than their own pleasure, and who claim no employment under government, except they may so far have distinguished themselves in some branch of philosophy as to merit an appointment to a professorship. In modern times however even this faculty of arts has supplied two sets of men, who are so educated as to be enabled immediately to enter into the service of government, namely, officers of internal administration and teachers. But they generally declare, on entering the faculty of arts, that they intend to belong to those branches of the faculty which comprehend political science and philology, and this is expressly stated in their matriculation.

It is evident that the different schools of which each Prussian university may be considered as composed, might be separate establishments. But it has been considered, that there are certain branches of knowledge, which, though not indispensably necessary to be acquired by persons who are employed by government, may still be considered useful to clergymen, judges, physicians, teachers, and officers of internal administration. These branches may be useful either as a mental discipline, as the mathematics and metaphysics, or, on account of the positive knowledge which they convey, as natural history, natural philosophy, and chemistry. In order to give the students an opportunity of acquiring this knowledge, the philosophical faculty has been instituted, which may be considered as the bond that unites the other parts of the institution and constitutes them into one body.

The object for which the Prussian universities have been established, being so different from that of similar institutions in England, and the internal organization consequently being also quite different, it may easily be supposed that the whole course of studies is different; and so in reality it is. The number of persons at the German universities who study Greek and Latin, and attend the lectures of the professors of these languages, is comparatively small, and mostly limited to those who wish to be teachers, and to know something more of the matter than is learned in the grammar-schools. Other students do not attend these lectures, nor is it necessary. For it is required by law, and must be proved by strict examination at the time of admission into the university, that the student has previously obtained such a knowledge of the Latin language as to be able to read the classical authors with ease, and to write Latin prose correctly, and also that he has made such progress in Greek as to understand an easy author. It is considered that the youth who has so far acquired the antient languages has had discipline enough of that kind in the grammar-school, and that on entering the university the objects of his studies should be changed. The attention of the student who has leisure to apply himself to branches of knowledge not immediately connected with his future pursuits is mainly directed to the investigation of nature, natural philosophy, physiology, and chemistry, with mathematics. Others however who prefer the investigation of the human mind enter with zeal on the study of the metaphysical and moral sciences, and others apply themselves to the various branches of the political sciences. The student however is well aware that all these studies constitute only a preparatory course, and that at the examination which he must undergo before he can claim to be employed by government, he never will be asked whether he has studied these sciences or has acquired any of these branches of knowledge. For that reason the number of those who apply themselves to these studies is comparatively small. By far the largest part of the youths turn their attention immediately to those branches of knowledge with which they must be acquainted before they can enter on the business of life as ministers, lawyers, and physicians.

It is not usual for the students at the German universities to take a degree, except for those who intend to practise as physicians, and who by taking the degree obtain the title of doctor, and are exempt from all further examination. There are persons who take the degree of doctor of divinity, of law, and of philosophy, but they are only a few and they are generally persons who aspire to professorships in the universities. It is rare that a person who has no such views aspires to this distinction merely for the sake of the honour.

The time which a student must spend at the university is not determined by law. Experience however has shown that a knowledge of law cannot be acquired in less than two years; that the branches of knowledge which comprehend the science of theology require three years; and that the information which a good physician should possess can hardly be obtained in the course of four years. Most of the students remain somewhat longer than the times which have been mentioned. In each year two courses of lectures are read, and these two periods are called semesters. Each semester lasts five full months. Thus the youths at the Prussian universities are occupied there at least thirty-eight weeks, which is about fifteen weeks more than the terms of Oxford or Cambridge.

From this account of the Prussian universities it will appear that nearly all the students, during the whole time of their residence at the university, apply themselves to the acquisition of that knowledge which is intimately connected with their future station in life. Before they are permitted to practise the professions, they must prove that their acquirements are such as to give them a just title to do so. As a specimen of the knowledgo required from those who enter the learned professions, we give that which is required from the clergyman. When he is admitted to holy orders, he must be thoroughly acquainted with ecclesiastical history, and consequently must be familiar with all the changes which the church of Christ has undergone from its establishment to the present time, and by what events these changes have been produced. He must also be acquainted with the most distinguished writers of the earlier ages of Christianity, and their different opinions respecting the constitution of the church. The practical part of his knowledge he is expected to draw from what is called Dogmatic, which explains the tenets of the Protestants as established by Luther, with the changes which they have undergone since his death, and the difference in the tenets professed by the different denominations of Christians. He must have read the whole of the New Testament in Greek, and studied critically one of the Gospels and two of the Epistles of St. Paul. A knowledge of the Hebrew language is not indispensable, but if the student knows it, he is considered to have additional merit. The moral sciences must have formed part of his studies, and he must be well acquainted with those passages of the Bible in which Christian duties are inculcated. When a student shows, by undergoing a strict examination, that he is well versed in these four parts of theology, he may be admitted to holy orders.

The age of admission into the universities is fixed by law on the completion of the eighteenth year. It happens however very frequently that even at that age the student has not acquired the knowledge which would enable him to attend the lectures of the professors with advantage, especially if his education has been neglected in early youth. Many youths therefore do not go to the university before the completion of their twentieth or twenty-first year; and this delay has a good effect on their conduct. At the university most of them are free from all control as to the employment of their time, and nearly so with respect to their conduct. It might be expected that this liberty would be followed by bad consequences, but experience has shown that young men in general, after the completion of their eighteenth year, have too much good sense to abandon themselves altogether to idleness and debauchery, and to neglect those studies which are indispensable to enable them to follow a profession.

Academical education in Prussia is finished at the universities: it begins in the gymnasia. The gymnasia were originally designed for preparing pupils to attend the lectures of the professors at the universities with ease and profit, and with this view Greek and Latin, with some mathematics, formerly constituted nearly the only objects of instruction. At this time they had a great resemblance to the English grammar-school. But government soon perceived that the time which the young men passed at the universities was hardly more than sufficient to enable them to acquire a complete knowledge of their profession; and it was frequently almost impossible for them to find time to make themselves acquainted with some branches of knowledge, which, though not strictly necessary for the practice of their professions, are considered as parts of a liberal education, and give to those who possess them an advantage over others in society. Accordingly it was considered that an instruction in Greek and Latin, with some mathematics, if conducted on a good system, could not occupy all the time of young men to the completion of their eighteenth year, and this consideration led to the introduction of many other branches of knowledge into these schools. At present hardly more than one-third of the time which the pupils pass at these schools is employed in teaching them those branches of knowledge which were formerly the only objects of instruction. The teachers opposed these changes, and created difficulties, but as they are appointed by government, their resistance was soon overcome. Thus many branches of knowledge have gradually found their way into these schools, among which are the first principles of natural philosophy and chemistry, natural history, especially the physiological parts, and a pretty extensive course of geography and of history, both antient and modern. Nothing however is taught which has an immediate reference to the future occupation of the pupils, with the exception of the Hebrew language, the elements of which those who are intended to be clergymen are obliged to acquire at school. The age of admission to the gymnasia is established by law at the completion of fourteen years, and the boys must remain there till they have completed their eighteenth year, but they frequently stay, as already observed, two or three years longer. Before they leave school, they must submit to a strict examination, in which they must show that they have acquired those branches of learning which are required by law from those who go to a university.

These two kinds of institutions, the universities and gymnasia, are, strictly speaking, established and supported by government for the purpose of supplying the state with a sufficient number of men capable of conducting all the branches of administration. The other Prussian schools are designed to give tho people that instruction which is considered necessary for them.

The Prussian government has for many years paid the greatest attention to the best means of obtaining a sufficient supply of good teachers for all kinds of schools. These persons, having been trained up as teachers, have no prospect of succeeding better in any other occupation. When they are appointed to a placo by government, they know that they are to remain there for several years, and that the improvement of their condition depends solely on the opinion which the state may form of their industry, ability, and their success in teaching. It is not easy for them to break off their engagement, as in that country there are very few institutions of education in which the choice of the teachers does not materially depend on government. Thus they are compelled to remain where they are, and to exert themselves to the utmost to attract the attention of government by instructing their pupils in the respective branches of knowledge prescribed by law. It will easily be admitted that even persons of moderate talents must become excellent teachers in such a situation in the course of ten years; and such persons will be able to continue to work efficiently at least to their fifty-fifth or sixtieth year.

Without entering into further details on this point, it is certain that the advantages which the Prussian schools have over similar institutions in this country, are mainly owing to the teachers having been trained for the business, and to the circumstance of their devoting their labours to the same school for twenty or thirty years.

The Prussian schools for the instruction of the people at large are divided into middling (or city) schools and elementary schools. The city schools are designed for the education of all those who, from their station in society, require to be better instructed than the lower classes, but do not require an academical education to qualify them for their future occupations. As the occupations for which the pupils are to be prepared in these schools are very various, there is a corresponding difference in the schools appropriated to this class with respect to the subjects of instruction. There are certainly some branches of knowledge which are properly considered as belonging to general instruction, and these are common to all the schools, but in each of them subjects are taught which have reference to the locality, and to the wants of the inhabitants and the neighbourhood. It is obvious that many kinds of instruction which are useful in a seaport would be quite out of place in a province two hundred miles from the sea, and that the population of a manufacturing district requires to be instructed in some branches of knowledge which are of no use to agriculturists and others. The largest establishments of this kind are called schools of practical knowledge (realschulen). As a general rule, six or seven teachers are regularly employed in them. The antient languages are not taught, with the exception of Latin, which however is taught to a less extent than in the gymnasia. On the other hand, more time is employed in the acquisition of scientific knowledge, but it is taught in a practical and not strictly scientific way. The principal objects of instruction are the mathematics (including commercial arithmetic), the natural sciences (which comprehend natural history, experimental philosophy, and chemistry, with special reference to the arts and manufactures), geography, history, the German and French, and sometimes the English languages, writing and drawing. Before the pupils enter these institutions, they must have acquired a sound and complete elementary education, and only youths who have attained the age of eleven or twelve years are admitted. They stay at these schools between three and four years. The smallest of the schools comprehended under this division are very little superior to the elementary schools as to the general instruction, except that a more extensive course of arithmetic, with an elementary knowledge of geography and the history of the country, is added. Such schools are frequently managed by a single teacher. The schools between these two extremes vary greatly in the number of teachers, in the branches of knowledge taught, and in the extent to which they are taught. But in all of them great attention is paid to the wants of the inhabitants of the place and the vicinity.

The elementary schools in Prussia are the most numerous, and by far the greater part of the people receive their education in them. The Prussian government has conferred a great benefit on the people by bestowing much attention on the improvement of these schools during the last thirty years, and the effects of this care are already perceptible. Though the number of these schools is very large, all of them are now provided with teachers, who are acquainted with the best methods of imparting to children the elements of knowledge, and of accustoming them to labour. The skill of these teachers in instructing the youths in elementary knowledge has enabled the government to increase the subjects of elementary education, and accordingly in most of these schools, in addition to religion, reading and writing, the elements of arithmetic, the history and geography of the country, and some notions of natural history begin to form part of the regular course of instruction.

An elementary school is generally, though not always, attached to a city school, and a city school always to a gymnasium. In such cases both schools are under the direction and management of the same persons, from which circumstance there results a closer connection between the subjects taught in both schools. For instance, when a gymnasium is united to a city school, there are six classes, but it is only in the two upper classes that subjects are taught which refer exclusively to university studies. The third class constitutes an intermediate stage, in which pupils designed for the university are mixed with others who are not. In this class the boys generally begin to learn the Greek language, but those who do not intend to go to the university are not compelled to attend the Greek class.

We have before observed that the Prussian schools have attained their present state of excellence mainly from the circumstance that all the teachers have been trained regularly for the business. Long experience has convinced the government that no real improvement in the education of youth can be effected without providing competent teachers. It has however been found that it is not necessary to be at any pains to get academical teachers. There are always persons who have such a decided inclination to some particular branch of knowledge, as willingly to make some sacrifice for the sake of pursuing it, and when such persons know that while they satisfy their inclination they can obtain a competent income and an honourable station in society, they gladly devote themselves to such a pursuit. The government therefore has considered that by attaching a sufficient salary to the different professorships in the universities, persons will never be wanting to fill those chairs with advantage to the state; and this opinion has proved to be well founded. The case is different with school teachers. It is their business to impart to their pupils the elements of knowledge, which have generally very few attractions for anybody, though it is impossible to make any progress in the acquisition of knowledge without being well acquainted with them. It often happens that persons well acquainted with these elements are not capable of communicating them to others, at least not to children, unless they have been trained to the occupation. When therefore the government began seriously to consider how the teaching in the gymnasia could be improved, and found that the most difficult part of the instruction in these schools was that of the antient languages, it conceived the idea of preparing the teachers for those schools by a training under the best Greek and Latin scholars of the age. This led to the erection of the Philological Seminaries, which are constituted simply thus:—The professors of the Greek and Latin languages at the universities explain to the students who have been admitted as members of the seminaries a classical author in such a manner as they think that it ought to be explained in the upper classes of the gymnasia. After proceeding in this way for two or three months, they direct those pupils who have made most proficiency to continue where they have left off, giving them the necessary time for preparation. The pupils do this as well as they can, and the professors point out the difficulties which they may have overlooked, by asking questions and by adding some few observations. Every member of the seminary must submit to this task by turns, and it will easily be supposed that by this method of proceeding the acquaintance of the students with the language must be increased, and much more so than if the professors were merely to lecture on the author. It has been observed that the first attempts of young men, even of those who have talents for teaching, are rarely attended with success, and this has been ascribed to their limited acquaintance with mankind in general, and the character of children in particular. It is obvious that knowledge of this description cannot be acquired from books, and that it can only be acquired by continual intercourse with children, and by early opportunities of practising the art of teaching.

This led to the establishment of the pedagogic seminaries, which are also connected with the universities, and placed under the direction of that professor of the theological or philosophical faculty who has distinguished himself by his zeal for the promotion of education. After having made the future teachers acquainted, by way of introduction, with the character of children, the professor introduces them into the school which is attached to each pedagogic seminary, and in which the future teacher has abundant opportunity of practising the art of teaching, and of seeing how it is practised by others. He also derives another advantage from attending this school. Passing successively through all the divisions of the school in this way, he soon becomes aware of the deficiency of his knowledge, and this conviction comes upon him at a time when he can remedy the deficiency without difficulty. As the university has the best teachers in every branch of knowledge, he has only to place himself under the professor of that science in which he wishes to improve himself, and thus he may soon acquire the necessary proficiency. It will easily be conceived that when a young man who is designed to be a teacher has attended this institution six or eight hours a week for three years, and is frequently ordered to instruct the pupils under the direction of the professor, he will acquire such skill in the management of children, that when he has to act independently, he has only to take up the task where he has left it off at the seminary. Without such opportunity of being initiated in the art of instruction, he might for a long time remain as it were in the dark, and he would only find out the right way after committing numerous mistakes, and making many useless experiments. The attendance on the philological and pedagogical seminaries takes up a considerable part of the future teacher's time during his stay at the university. The greater part of the young men who have been trained up in this way, are afterwards appointed teachers at the gymnasia, but many of them are also employed in the city schools, in which many branches of knowledge are taught that can hardly be acquired to a certain degree of perfection without going to the university. Formerly all the teachers in these two classes of schools were young clergymen, who were required to be teachers before receiving an appointment to a living; and although at present this is occasionally done, most of the teachers have been merely trained for that vocation. Young clergymen are only employed as teachers in these schools when they have regularly attended the seminaries, and have there shown considerable aptitude for teaching, but few of them are able to prosecute both pursuits with success. Thus the young men who are designed for teachers may be said to constitute at present as distinct a body in the Prussian universities as those who are designed to be clergymen. This is a great step gained, and the consequences cannot fail to be highly beneficial to education.

Having succeeded so well in providing a sufficient number of teachers for the gymnasia and upper classes of the city schools, the Prussian government began to direct its attention to make the same provision for the elementary schools. The seminaries for schoolmasters, as those institutions are called, have grown up during the last thirty years. They are not connected with the universities, inasmuch as the knowledge required from the teachers of these schools may be obtained without an academical education. Most of these institutions are established in small towns, and some of them in villages, in order that the attention of the young men who attend them may not be distracted. Young men who have been educated in elementary schools are admitted into these institutions between the ages of sixteen and twenty years; but they must have previously acquired that amount of knowledge which is taught in the lower schools. If they are deficient in this respect, they are obliged to go through a preparatory course before entering the seminary. They remain in the institution from two to three years. Besides the director of the establishment, two or three regular teachers are employed, and a school is attached to it. The time of the future teacher during his stay in the seminary is divided between improving his knowledge, and acquiring the art of teaching children. The first half of the time that he remains in the institution is principally employed in attaining the former object, and the second half is devoted to the latter object. His studies are directed by the teachers and the director, who frequently call upon him to give an account of what he is doing. When he is admitted into the school, he is at first only a spectator, and the teachers of the seminary instruct the children in his presence. In course of time the seminarists are called upon to continue the work begun by the teachers. They are also generally present when other seminarists instruct the class, and this affords them many opportunities of comparing the different modes of teaching, so far as they depend on the different characters of the teachers. At the meetings of the teachers, which regularly take place after the children have left the school, the teachers, under the direction of the head master, make their observations on the teaching of the seminarists, on the mistakes they have committed, and point out to them what they ought to do, in order to obtain their object with greater certainty. It is generally found that after having practised teaching for a year or a year and a half in this manner, these young men have so far acquired the art, that an elementary school may be safely entrusted to them. When these institutions were established, the instruction was limited to the common subjects taught in the lower schools, which are reading, writing, arithmetic, and the principal tenets of religion; but the seminarists were of course obliged to learn all these subjects to a greater extent than they are usually taught in the lower schools. But as soon as it appeared that the acquisition of this amount of knowledge did not entirely fill up the time of the seminarists, government extended the plan, and added the elements of geometry, the study of the native language, the geography, and principal historical events of the country, and music. These subjects are also now in course of being introduced into the elementary schools themselves. Before the seminarists leave the institution, they must submit to an examination, which is conducted by a committee composed of the director of the seminary, and one or more deputies sent by the provincial government. According to the result of this examination, they receive their testimonials, in which the degree of their talent and ability for teaching is stated, and also in what kinds of knowledge they have distinguished themselves, or in what they have been found deficient.

The Prussian government controls all the public schools and institutions for education, but not all of them to the same extent. The Universities, being considered only as schools in which the different functionaries of government receive the requisite instruction, are in all respects subject to the immediate control of the state, which determines what those persons must learn, and by whom they are to be taught; and the same principle applies to the Philological and Pedagogical Seminaries. If the Gymnasia were attended by those only who are designed for an academical education, they would probably be directed and entirely superintended by government; but as a City School is always united to those institutions, government appoints only the teachers, and determines the subjects of instruction, entrusting a portion of the superintendence to the local authorities and the heads of the communities in which the schools are situated. As to the Seminaries for Schoolmasters, if these institutions were left to the direction of the public at large, no intimate connection between them and the elementary schools could be effected, and the control would be either incomplete or capricious. Hence government has assumed the entire direction and superintendence of these schools. But when the teachers who have been brought up in these institutions have left them, the government does not interfere as to the mode of their being employed or engaged. The choice of the teachers for the city schools and the elementary schools is always left to a committee composed of certain deputies of the community and of the local authorities, which committee has the immediate superintendence of the schools, and is in some measure responsible for the instruction. But though the government does not interfere with the internal arrangement of these schools, it reserves the exclusive power of determining the subjects which are to be taught in every kind of schools, and, as far as respects the city schools, in every particular school. Every committee is also bound by law to draw up an annual report of the condition of the school during the last year, in which are stated all the changes that have taken place in it; and the government, if it thinks it advisable, proposes alterations.

(Cousins's *Report on the State of Public Instruction in Germany*, &c.; Harnisch, *Handbuch für das Deutsche Volksschulwesen*; Ohlert, *Die Schule, oder Elementarschule, Bürgerschule, und Gymnasium*; and *Journal of Education*, vols. vi., viii., and x.)

SCHOOLS, ENDOWED. An Endowed School in England is a school which was established and is supported by funds given and appropriated to the perpetual use of such school, either by the king or by private individuals. Endowed schools may be divided, with respect to the objects of the founder, into grammar-schools, and schools not grammar-schools. A grammar-school is properly a school in which the learned languages, the Latin and the Greek, are taught, as will hereafter be more fully explained. Endowed schools may also be divided, with respect to their constitution for the purposes of government, into schools incorporated and schools not incorporated. Incorporated schools belong to the class of corporations called eleemosynary, which comprehends colleges and halls, and chartered hospitals or almshouses.

Endowed schools are comprehended under the general legal name of Charities, as that word is used in the act of the 43rd of Elizabeth, chap. 4, which is entitled 'An Act to redress the Misemployment of Lands, Goods, and Stocks of Money heretofore given to Charitable Uses.' Incorporated schools have generally been founded by the authority of letters patent from the crown, but in some cases by act of parliament. The usual course of proceeding has been for the person who intended to give property for the foundation of a school, to apply to the crown for a licence. The licence is given in the form of letters patent, which empower the person to found such a school, and to make, or to empower others to make, rules and regulations for its government, provided they are not at variance with the terms of the patent. The patent also incorporates certain persons and their successors, who are named or referred to in it, as the governors of the school. This was the form of foundation in the case of Harrow School, which was founded by John Lyon, in the fourteenth year of Elizabeth, pursuant to letters patent from the queen. Sometimes the master and usher are made members of the corporation, or the master only; and in the instance of Berkhampstead School, which was founded by act of parliament (2 & 3 Edw. VI., reciting certain letters patent of Henry VIII.), the corporation consists of the master and usher only, of whom the master is appointed by the crown, and the usher is appointed by the master. The lands and other property of the school are vested in the corporation, whose duty it is to apply them, pursuant to the terms of the donation, in supporting the school, that is, in paying the master and usher such sums as they are entitled to receive, and for other purposes necessary for the support of the school. Many school endowments are of a mixed nature, the funds being appropriated both to the support of a free-school and for other charitable purposes. These other purposes are very various; but among them the union or connection of an hospital or almshouse with a free-school is one of the most common.

Where there is no charter of incorporation, which is the case in a great number of school endowments, the lands and other property of the school are vested in trustees, whose duties as to the application of the funds are just the same as in the case of an incorporated school. If the founder has declared that there shall always be a certain number of trustees, or that the original number shall always be filled up whenever it is diminished by death to a certain amount, it is necessary from time to time for the actual trustees to add to their numbers by such legal modes of conveyance as shall vest the school property in them and the new trustees jointly. These conveyances sometimes cause a considerable expense; and when they have been neglected, which is often the case, and the estates have consequently become vested in the heir-at-law of the surviving trustee, some difficulty is occasionally experienced in finding out the person in whom the school estates have thus become vested by operation of law. When the school property consists of money, the same kind of difficulty arises; and money is also more liable to be lost than land.

Every charity, and schools amongst the rest, seems to be subject to visitation. We shall first speak of incorporated schools.

The founder may make the persons to whom he gives the school property on trust also the governors of his foundation for all purposes; and if he names no special visitor, it appears that such persons will be visitors as well as trustees. If he names a person as visitor, such person is called a special visitor; and it is a general rule that if the founder names no special visitor, and does not constitute the governors of his foundation the visitors, the heir-at-law of the founder will be visitor; and if there is no heir-at-law, the crown will visit by the lord keeper of the great seal. The king is visitor of all schools founded by himself or his ancestors. The duties of trustees and visitors are quite distinct, whether the same persons are trustees and visitors, or the trustees and visitors are different. It is the duty of trustees to preserve the school property, and to apply it to the purposes intended by the founder. In respect of their trust, trustees are subject to the jurisdiction of the Court of Chancery, like all other trustees; and of course they are answerable for all misapplication of the funds. It is the visitor's duty to inquire into the behaviour of the master and usher in their respective offices, and into the general conduct of the school. He must judge according to the founder's rules, which he cannot alter unless he is empowered by the terms of the donation to do so. There seems to be no reason for supposing that the king, in respect of royal foundations, has any further power than other persons, and consequently he cannot alter the terms of the donation, unless this power was originally reserved to the founder and his successors; but on this matter there may be some difference of opinion. The visitor, or those who have visitorial power, can alone remove a master or usher of an endowed school. The Court of Chancery never removes a master or usher, when they are part of the corporate body, on the general principle that this court has no power to remove a corporator of any kind; and when there is a visitor, or persons with visitorial power, the Court never attempts directly to remove a master or usher, even if they are not members of the corporation.

This is the law on the subject. (17 Ve., Att.-Gen. *v.* the earl of Clarendon.) But law does not always regulate the decrees of a court of equity. In the case of the Attorney-General *v.* Brown, which does not appear to be reported, the Master of the Rolls decreed that Brown, who was a member of the corporation of Tideswell school, both in his capacity of vicar of the parish of Tideswell and in his capacity of master of the school, should resign one of the two places.

Trustees of endowed schools which are not incorporated, are accountable in a court of equity for the management of the school property. But the internal management of the school still belongs to the special visitor, if there is one; and if there is no special visitor, it belongs to the founder's heir. Trustees of endowed schools, simply as such, are merely the guardians of the property, as already observed; and it is their duty to take care of it, and to apply the income according to the founder's intention. It has however happened that in schools not incorporated the jurisdiction of the Court of Chancery and the visitorial jurisdiction have not been kept quite distinct; and cases have arisen in which it has been found very difficult to determine what ought to be the proper mode of proceeding. It will perhaps be difficult to find an instance (except that of the Attorney-General *v.* Brown, and even the effect of that was only to put the master to his election) where the Court of Chancery has affected to remove a master even of a school not incorporated, though there are cases in which it has been attempted indirectly.

In the case of Atherstone school, which was founded by letters patent of Elizabeth, 1593 (*Reports of Charity Commissioners*, 29th Rep., part ii., p. 955), no express power was given to the governors to remove the master. On an information being filed by the master, the chancellor thought that the power of suspension and amotion of the master ought to have been vested in the governors and the bishop of the diocese concurrently; and he referred it to the master, to approve of some convenient form of such joint regulation. But this and other similar cases are of very doubtful authority. Properly, the removal of a master is only effected by a person appointed as visitor by the founder; and if there is no such visitor, and no founder's heir, the proper mode of proceeding in such case is to apply by petition to the keeper of the great seal as visitor on behalf of the crown, and not to the chancellor by bill, or by bill and information. There is no doubt that a special visitor, who receives the proper power for that purpose from the founder, can remove the master of a school; and it is equally certain that if the founder has appointed no special visitor, the visitorial power belongs to his heir-at-law, if one can be found. It may however be true, as it is sometimes asserted, that it would be difficult to find an instance in which the founder's heir has exercised such visitorial power.

A free grammar-school is an endowment for teaching the learned languages, or Greek and Latin, and for no other purpose, unless the founder has prescribed other things to be taught besides grammar. This legal meaning of the term grammar-school has been fixed by various judicial decisions, and it is quite established, that if the founder merely expresses his intention to found a grammar-school, the school must be a school for teaching Latin and Greek only. If it should happen that the endowment has for a long time been perverted from its proper purposes, this will not prevent the Court of Chancery from declaring a school originally designed for a grammar-school, to be still a grammar-school, and it will give the proper directions for carrying into effect the founder's intentions, whatever may be the length of time during which they have been disregarded. This was the case with the grammar-school of Highgate, in the county of Middlesex, which was founded by Sir Roger Cholmeley, under letters patent of queen Elizabeth, under the title of the Free Grammar-school of Roger Cholmeley, Knight. The statutes were made in 1571 by the wardens and governors, with the consent of the Bishop of London, under the authority of the letters patent. The first statute ordered that the schoolmaster should be a graduate, and should teach young children their A B C, and other English books, and to write, and also in their grammar as they should grow up thereto. An information which was filed against the governors, charged that the school had been converted from a free grammar-school into a mere charity school, and that the governors had in other ways abused their trust. The facts of the abuse were established, but it was shown that so far back as living memory could go, the school had been merely a place of instruction in English, writing, and arithmetic; and also that in other respects the statutes had not been observed as far back as the year 1649. Notwithstanding this, it was declared by the chancellor (Eldon) that this was a school originally intended for the purpose of teaching grammar, and a decree was made for restoring the school according to the intention of the founder.

As to teaching something besides Latin and Greek in an endowed school, Lord Eldon observes (Att.-Gen. *v.* Hartley, 2 J. & W., 378), 'if there was an antient free grammar-school, and if at all times something more had been taught in it than merely the elements of the learned languages, that usage might engraft upon the institution a right to have a construction put upon the endowment different from what would have been put upon it if a different usage had obtained.' When the founder has only intended to establish a grammar-school, and has applied all the funds to that purpose, none of them can be properly applied to any other purpose, however useful it may be, such as teaching the modern languages or other branches of knowledge. This legal position cannot be disputed. When the funds of a school have increased so as to be more than sufficient for the objects contemplated by the founder, the Court of Chancery will direct a distribution of the increased funds, but it will still apply the funds to objects of the same kind as those for which the founder gave his property. If then a founder has given his property solely for the support of a grammar-school, it is inconsistent with his intention to apply any part of the funds to other purposes, such for instance as paying a master for teaching writing and arithmetic; and yet this has been done by the Court of Chancery in the case of Monmouth school (3 Russ., 530) and in other cases. The foundation of Monmouth school consists of an almshouse, a free grammar-school for the education of boys in the Latin tongue, and other more polite literature and erudition, and a preacher. The letters patent declared that 'all issues and revenues of lands to be given and assigned for the maintenance of the almshouse, school, and preacher, should be expended in the sustentation and maintenance of the poor people of the almshouse, of the master and under-master of the school, and of the preacher, and in repairs of the lands and possessions of the charity.' Notwithstanding this, the Court of Chancery appointed a writing-master at a salary of 60*l*. per annum, to be paid out of the issues and revenues, and thus it took away 60*l*. per annum from those to whom the founder had given it. This was done on the authority of a case in the year 1797, which was itself a bad precedent, and notwithstanding that Lord Eldon, during the long time that he held the great seal, had constantly opposed such application of funds which were appropriated solely to grammar purposes.

Lord Eldon's decision in the case of Market Bosworth school (Attorney-General, *v.* Dixie, 3 Russ., 534) established an usher in the school, whose sole occupation was to be to instruct the scholars in English, writing, and arithmetic, and it gave the usher a salary of 90*l*. per annum out of the school funds. But in doing this Lord Eldon merely did what the donor intended. Market Bosworth is one of those grammar-schools in which the founder has directed that other things should be taught besides Latin and Greek. According to the statutes, the school was to be divided into two branches, the lower school and the upper, and 'in the first form of the lower school shall be taught the A B C, Primer, Testament, and other English books.' In the upper school the instruction was confined to Latin, Greek, and Hebrew. It is therefore in this case as clear that the founder's intention was carried into effect by the decree of the court, as it is clear that in the case of the Monmouth school such intention was violated. The case of Monmouth school however furnished a precedent, which has been followed in other cases; and Sir J. Leach, in the case of Sherburn school and hospital (Att.-Gen., *v.* Gascoigne, 2 M. & K., 647), said, that 'he was glad of an opportunity of holding, upon the authority of the case before Lord Lyndhurst (the Monmouth school case), that the teaching of writing and arithmetic might be well introduced into a scheme for the management of a free grammar-school.'

There are many grammar-schools, probably a considerable majority of the whole number, in which nothing is provided for or nothing intended by the founder except instruction in grammar, which, as the term was then understood, appears to have meant only the Latin and Greek languages. Where provision is made for other instruction in addition to, or rather, as preparatory to the grammar instruction, similar modes of expression have often been used by the founder or the makers of the statutes. In the founder's rules for the grammar-school of Manchester, which has now an income of above 4000*l*. per annum, it is said, 'The high-master for the time being shall always appoint one of his scholars, as he thinketh best, to instruct and teach in the one end of the school all infants that shall come there to learn their A, B, C, Primer, and sorts, till they being in grammar,' &c. In all cases of grammar-schools where this instruction is to be given, it was evidently intended as a preparation for and not as a substitute for grammar. It was therefore clearly an abuse in the case of the Highgate school to have converted it into a mere school for reading, writing, and arithmetic; but it is equally an abuse in the case of the Manchester school to make the following regulation as to the admission of pupils, which was in force at the time of the Charity Commissioners' Inquiry:—'All boys who are able to read are admitted on application to the head master into the lower school, where they are instructed in English and the rudiments of Latin by the master of that school. They are so admitted about the age of six or seven.'

Grammar-schools have now for a long time been mainly regulated by the Court of Chancery, which, though affecting merely to deal with them in respect of the trusts and the application of the trust-monies, has in fact gone much farther. On the whole it has perhaps done as much against the intention of founders—and therefore wrongfully, its professed doctrine being to carry the founder's intentions into effect—as it has for furthering the intentions of founders. In saying this, we do not mean to say that it has done more harm than good. The court may be applied to for the purpose of establishing a school where funds have been given for the purpose, but the object cannot be effected without the aid of the court. It may also be applied to for the purpose of correcting such a misapplication of the funds as in the case of the Highgate school, which in that instance was equivalent to establishing it. The court may also be applied to, which is a common case, in order to sanction the application of the school funds when they have increased beyond the amount required for the purposes indicated by the founder. In this last case however, if the school is a grammar-school, though the court will apply part of the funds to other purposes than grammar, as appears by the case of the Monmouth school, still it keeps mainly in view the fact of such school being for grammar, in directing the application of surplus funds. Accordingly such surplus funds are often applied in establishing exhibitions or annual allowances to be paid to meritorious boys who have been educated at the school during their residence at college. The master's scheme for the regulation of Tunbridge school in Kent, which was confirmed by the Court of Chancery, established sixteen exhibitions of 100*l*. each, which are tenable at any college of either university, and payable out of the founder's endowment. It also extended the benefits of the school beyond the limits fixed by the founder, and made various other regulations for the improvement of the school, having regard to the then annual rents of the school estates.

When the application has been an honest one, the schemes sanctioned by the Court of Chancery may generally be considered as aiming at least to carry the founder's intention into effect, and as calculated on the whole to benefit the school. But in some cases decrees have been obtained by collusion among all the parties to the suit, against which it is no security that the attorney-general is a necessary party to all bills and informations about charities. The founder of a school and hospital in one of the midland counties, among other things appointed that 'the schoolmaster should be a single person, a graduate in one of the universities of Oxford or Cambridge,' &c.; and he did 'further will that if any schoolmaster so to be chosen should marry or take any woman to wife, or take upon him any cure of souls, or preach any constant lecture, then in every of the said cases he should be disabled to keep or continue the said school.' The trustees dispensed with these restrictions and qualifications, but afterwards finding that they could not do this, they applied to the Court of Chancery, conceiving that the court had full power, or would at least assume the power, to alter the founder's rules. And they judged right. The court ordered, among other things, that a clergyman should be the head master, though the founder did not intend to exclude laymen; and that the head master was not to be restricted from marrying or taking upon him the cure of souls, &c. This mode of dealing with a founder's rules has not much appearance of an attempt to carry them into effect. If the court can dispense with the restriction as to marriage in such case, there seems no reason why it might not assume a similar dispensing power in the case of fellowships in colleges.

This clause about marrying occurs in the rules of several grammar-schools, for instance in those of Harrow school. The rule may be wise or unwise; but it was once observed, and it ought to be observed still until it is altered.

It remains to mention another matter that concerns the management of grammar-schools and the qualification of the masters. It appears from the rules of many grammar-schools that religious instruction according to the principles of the Church of England, as established at the Reformation, is a part of the instruction which the founder contemplated; and when nothing is said about religious instruction, it is probable that it was always the practice to give such instruction in grammar-schools. That it was part of the discipline of such schools before the Reformation cannot be doubted, and there is no reason why it should have ceased to be so after the Reformation, as will presently appear. It is generally asserted that in every grammar-school religious instruction ought to be given, and according to the tenets of the Church of England; and that no person can undertake the office of schoolmaster in a grammar-school without the licence of the ordinary. This latter question was argued in the case of Rex *v.* the Archbishop of York. (6 *T. R.*, 490.) A mandamus was directed to the archbishop directing him to license R. W. to teach in the grammar-school at Skipton in the county of York. The return of the archbishop was that the licensing of schoolmasters belongs to the archbishops and bishops of England; that R. W. had refused to be examined; and he relied as well on the antient canon law as upon the canons confirmed in 1603 by James I. (*The Constitutions and Canons Ecclesiastical*, 'Schoolmaster,' 77, 78, 79.) The return was allowed, and consequently it was determined that the ordinary has power to license all schoolmasters, and not merely masters of grammar-schools. As to school-masters generally, the practice is discontinued, and probably it is not always observed in the case of masters of grammar-schools.

The form of the ordinary's licence is as follows:—'We give and grant to you, A. B., in whose fidelity, learning, good conscience, moral probity, sincerity, and diligence in religion we do fully confide, our licence or faculty to perform the office of master of the grammar-school at H., in the county, &c., to which you have been duly elected, to instruct, teach, and inform boys in grammar and other useful and honest learning and knowledge in the said school allowed of and established by the laws and statutes of this realm, you having first sworn in our presence on the Holy Evangelists to renounce, oppose, and reject all and all manner of foreign jurisdiction, power, authority, and superiority, and to bear faith and true allegiance to her majesty Queen Victoria, &c., and subscribed to the thirty-nine articles of religion of the United Church of England and Ireland, and to the three articles of the thirty-sixth canon of 1603, and to all things contained in them, and having also before us subscribed a declaration of your conformity to the Liturgy of the United Church of England and Ireland as is now by law established. In testimony,' &c.

From this licence it appears that the master of every school who is licensed by the ordinary must be a member of the Church of England, and must take the oath and make the subscriptions and declarations which are recited in the licence.

It is a notion not uncommon at the present day, that the master of a grammar-school must be a graduate of one of the universities and in holy orders; and such is certainly the present practice. But it is by no means always the case that the rules of endowed schools require the master to be in holy orders. The founders seem generally to have considered this a matter of indifference, but many of them provided that if the master was in orders, or took orders, he should not at least encumber himself with the cure of souls. The principle clearly was, that the master of a grammar-school should devote himself solely to that work, and it was a good principle. The Court of Chancery, as we have seen, has in various cases ordered that the master should be a clergyman, where the founder has not so ordered; but such order may be safely neglected. Dean Colet, the founder of St. Paul's School, London, ordered by his statutes, that neither of the masters of that school, if in orders, nor the chaplain, shall have any benefice with cure or service which may hinder the business of the school. He appointed a chaplain to the school (who, we believe, has since been turned into a master), thereby appearing to intend that the religious instruction should not be given by the masters of grammar, who would be fully employed otherwise.

It has sometimes been doubted whether a master of a grammar-school could hold ecclesiastical preferment with it. If the founder has not forbidden this, there is no rule of law which prevents him. If the holding of the two offices should cause him to neglect the duties of either, the remedy is just the same as if he neglected either of his offices for any other cause.

Many grammar-schools are only free to the children of a particular parish, or of some particular parishes; but this privilege has occasionally been extended to a greater surface, as in the case of Tunbridge school. Some are free to all persons, which is the case with some of King Edward VI.'s endowments. Sometimes the number of free boys is limited, but the master is allowed to take pay scholars, either by usage or by the founder's rules. Harrow school was intended for the free instruction of the children of Harrow parish, but the governors, with the consent of the master, can admit other children into the school. At present the practice is for all masters of grammar-schools to take boarders if they choose, but in some cases the number is limited. Abuses undoubtedly have arisen from the practice of the master taking boarders, and the children of the parish or township for which the school was intended have been neglected or led to quit the school sometimes in consequence of the head-master being solely intent on having a profitable boarding-school. But it is certain that in most cases the school has benefited by the master taking boarders; and this has frequently been the only means by which the school has been able to maintain itself as a grammar-school. When the situation has been a good one, an able master has often been found willing to take a grammar-school with a house, and a small salary attached to it, in the hope of making up a competent income by boarders. As this can only be effected by the master's care and diligence in teaching, a small neighbourhood has thus frequently enjoyed the advantage of its grammar-school, which otherwise would have been lost.

There has never been any general superintendence exercised over the endowed schools of this country. The Court of Chancery only interferes when it is applied to, and then only to a certain extent; and visitors are only appointed for particular endowments; they are also often ignorant of their powers, and they rarely exercise them. As many of these places have only small endowments, are situated in obscure parts, with the property vested in unincorporated trustees, who are ignorant of their duty, and sometimes careless about it, we may easily conceive that these schools would be liable to suffer from fraud and neglect, both of trustees and masters; and this has been the case. The object of the statute of Elizabeth was to redress abuses in the management of charities generally; but a great many endowments for education were excepted from the operation of that statute, which indeed seems not to have had much effect, and it soon fell nearly into disuse. Applications for the redress of abuses have, from time to time, been continually making to the Court of Chancery, and Berkhampstead school has now, for a full century, been before the court. In many cases the governors of schools have obtained acts of parliament to enable them better to administer the funds. This was done in the case of Macclesfield school by an act of the year 1774, and another for the same school has recently been obtained. An act of parliament was also obtained in 1831 for the free-school of Birmingham, the property of which had at that time increased considerably in value, and is still increasing. Both these schools were foundations of Edward VI., and were endowed with the property of suppressed religious foundations.

The condition of the endowments for education in England may now be collected from the Reports of the Commissioners for Inquiry into Charities. In 1818 commissioners were appointed under the great seal, pursuant to an Act passed in the 58th year of the reign of George III., entitled 'An Act for appointing Commissioners to inquire concerning Charities in England for the Education of the Poor.' A great many places were excepted from the operation of this Act. The commission was continued and renewed under various acts of parliament, the last of which (5 and 6 William IV., c. 71) was entitled 'An Act for appointing Commissioners to continue the Inquiries concerning Charities in England and Wales until the 1st day of August, 1837.' All the exceptions contained in the first Act were not retained in the last; but the last Act excepted the following places from inquiry: 'The universities of Oxford and Cambridge, and the colleges and halls within the same; all schools and endowments of which such universities, colleges, or halls are trustees; the colleges of Westminster, Eton, and Winchester; the Charter House; the schools of Harrow and Rugby; the Corporation of the

Trinity House of Deptford Strond; cathedral and collegiate churches within England and Wales; funds applicable to the benefit of the Jews, Quakers, or Roman Catholics, and which are under the superintendence and control of persons of such persuasions respectively.' Under the last act the commissioners completed their inquiries into endowments for education, with the exceptions above specified. The reports of the commissioners contain an account of the origin and endowment of each school which was open to their inquiry, and also an account of its condition at the time of the inquiry. The reports are very bulky and voluminous, and consequently cannot be used by any person for the purpose of obtaining a general view of the state of these endowments; but for any particular endowment they may be consulted as being the best, and, in many cases, the only accessible sources of information.

The number of grammar-schools reported on by the commissioners is about 440. What is the number of those exempted from the inquiry, we cannot state; but it must be considerable. The total income of these 440 schools is about 88,000*l.* In this estimate the gross income of the school estates is generally that which has been taken, except when the charity is applicable to other purposes besides education, in which cases the income of the school is estimated at that sum which is actually paid in salaries and for other school purposes. Of these schools, 65 had an income not exceeding 20*l.* per annum; and 15 had an income above 1000*l.* per annum; and 38 (including the 15) had an income above 500*l.* per annum. This total income of grammar-schools would be greatly increased if the income of the excepted schools were added; and there is no doubt that the income of the whole number of grammar-schools must exceed or at least come near to 100,000*l.*

As to the total income of the schools not grammar-schools we are not able to state anything with precision; but from an estimate formed upon the commissioners' reports, before they were completed under the last Act for continuing the inquiry, it seems to be a safe conclusion that the gross income of endowed schools, not grammar-schools, is about double that of the grammar-schools.

The previous remarks on grammar-schools must be taken subject to the provisions contained in a recent act of parliament, which is the only attempt that has been made by the legislature to regulate schools of this class. This Act (3 and 4 Vic., c. 77) is entitled 'An Act for improving the condition and extending the benefits of Grammar-Schools.' The Act recites, among other things, that the 'patrons, visitors, and governors of such grammar-schools are generally unable of their own authority to establish any other system of education than is expressly provided for by the foundation, and her Majesty's courts of law and equity are frequently unable to give adequate relief, and in no case but at considerable expense.' The Act then declares that the courts of equity shall have power, as in the Act provided, 'to make such decrees or orders as to the said courts shall seem expedient, as well for extending the system of education to other useful branches of literature and science, in addition to or (subject to the provisions thereinafter contained) in lieu of the Greek and Latin languages, or such other instruction as may be required by the terms of the foundation or the then existing statutes, as also for extending or restricting the freedom or the right of admission to such school, by determining the number or the qualifications of boys who may thereafter be admissible thereto as free scholars or otherwise, and for settling the terms of admission to and continuance in the same, and to establish such schemes for the application of the revenues of any such schools as may in the opinion of the court be conducive to the rendering or maintaining such schools in the greatest degree efficient and useful, with due regard to the intentions of the respective founders and benefactors, and to declare at what period, and upon what event, such decrees or orders, or any directions contained therein, shall be brought into operation; and that such decrees and orders shall have force and effect, notwithstanding any provisions contained in the instruments of foundation, endowment, or benefaction, or in the then existing statutes;' but it is provided, that if there shall be any special visitor appointed by the founder or other competent authority, he shall be heard on the matters in question, before the court makes any orders or decrees.

This enactment extends the power of the court over grammar-schools very considerably, as will appear from what has been said; not so much however, if we view what the court has done, as if we take the declarations of the most eminent equity judges as to what the court can do. The power however of changing a grammar-school into one not a grammar-school, which is given by this Act, is a considerable extension of authority; but the power is limited to cases (§ 3) where the necessity of such a change arises from insufficiency of the revenues of a grammar-school for the purpose of such school. But this provision, as it has properly been remarked, will be of very difficult application; for in many successful grammar-schools the revenue is small, and in some which are not successful it is large. Smallness of revenue therefore will not of itself prove 'insufficiency of revenues' in the sense intended by the Act. The same section contains also a provision, that except in this case of insufficient revenues, the court shall not by this Act be authorised to dispense with any statute or provision now existing, so far as relates to the qualification of any schoolmaster or under-master. The dispensing power then which the court has often assumed, as shown in some instances above mentioned, remains as it was; that is, it does not exist at all.

When a grammar-school shall have been made into another kind of school under the provisions of this Act, it is still to be considered a grammar-school, and subject to the jurisdiction of the ordinary as heretofore.

In case there shall be in any city, town, or place, any grammar-school or grammar-schools with insufficient revenues, they may be united, with the consent of the visitor, patron, and governor of every school to be affected thereby. The legal meaning of city and town (township) is sufficiently precise, but 'place' has no legal meaning, and the framers of the Act have forgotten to give it one in their 25th section, which treats of the construction of terms in that Act.

The court is also empowered (§14) to enlarge the powers of those who have 'authority by way of visitation or otherwise in respect of the discipline of any grammar-school;' and where no authority by way of visitation is vested in any known person, the bishop of the diocese may apply to the Court of Chancery, stating the facts, and the court may, if it so think fit, give the bishop liberty to visit and regulate the said school in respect of the discipline, but not otherwise. This provision, for various reasons, will prove completely inoperative.

The Act gives a summary remedy against masters who hold the premises of any grammar-school after dismissal or after ceasing to be masters. Such masters are to be turned out in like manner as is provided in the case of other persons holding over, by the act of the first and second Victoria, entitled 'An Act to facilitate the Recovery of Possession of Tenements after due Determination of the Tenancy.'

All applications to the court under this Act may be (and *must*) made by petition only, and such petitions are to be presented, heard, and determined according to the provisions of the 52 Geo. III., c. 101.

The Act saves the rights of the ordinary. It is also declared not to extend 'to the universities of Oxford or Cambridge, or to any college or hall within the same, or to the university of London, or any colleges connected therewith, or to the university of Durham, or to the colleges of St. David's or St. Bees, or the grammar-schools of Westminster, Eton, Winchester, Harrow, Charter-House, Rugby, Merchant Tailors', St. Paul's, Christ's Hospital, Birmingham, Manchester, or Macclesfield, or Lowth, or such schools as form part of any cathedral or collegiate church.' So the exemption does not extend to the grammar-schools of which the universities of Oxford or Cambridge, or the colleges and halls within the same, are trustees, though these schools were excepted from the commissioners' inquiry in the 5 and 6 Wm. IV., c. 71.

It is not necessary to make any comment on an Act the general purport of which is intelligible enough; its technical defects will be discovered as the Act comes to be applied. In the present state of this country, it is perhaps a wise measure to give those enlarged powers to the Court of Chancery, the officers and judges of which are better acquainted with the subject of grammar-schools than any other existing authorities.

Endowments for Education are probably nearly as as endowments for the support of the church. Bef the Reformation there were schools connected with ma religious foundations, and there were also many pr endowments for education. Perhaps one of the oldest schools of which anything is known is the school of Canterbury. Theodore, who was consecrated archbishop of Canterbury in 668 (according to some authorities), founded a school or village by licence from the pope. This school certainly existed for a long time; and there is a record of a suit before the archbishop of Canterbury in 1321, between the rector of the grammar-schools of the city (supposed to be Theodore's school or its representative) and the rector of St. Martin's, who kept a school in right of the church. The object of the suit was to limit the rector of St. Martin's in the number of his scholars. This school probably existed till the Reformation, at least this is the time when the present King's school of Canterbury was established by Henry VIII., and probably on the ruins of the old school. Before the Reformation schools were also connected with chantries, and it was the duty of the priest to teach the children grammar and singing. There are still various indications of this connection between schools and religious foundations, in the fact that some schools are still or were till lately kept in the church, or in a building which was part of it. There are many schools still in existence, which were founded before the Reformation, but a very great number was founded immediately after that event, and one object of king Edward VI. in dissolving the chantries and other religious foundations then existing, was for the purpose of establishing grammar-schools, as appears from the recital of the Act for that purpose (1 Ed. VI., c. 14). But as Strype observes, in his 'Ecclesiastical Memorials,' 'this Act was grossly abused, as the Act in the former king's reign for dissolving religious houses was. For though the public good was pretended thereby (and intended too, I hope), yet private men in truth had most of the benefit, and the king and commonwealth, the state of learning and the condition of the poor, left as they were before, or worse.' It appears also that in the confusion consequent on these violent changes, and the eagerness of all persons to get something of the spoil, schools were even suppressed which did not come with the terms of the Act. It is also certain that new schools were not always established in those places where a school had previously been connected with a religious foundation. There was a chantry at Sandwich in Kent, in the school belonging to which Roger Manwood received the rudiments of his education. The chantry was suppressed under the Act of Edward VI., and no school was established in its place. The want of a school there subsequently led to the foundation of the present grammar-school, for which the said Roger Manwood obtained a licence in the usual form from queen Elizabeth.

The king however did found a considerable number of schools, now commonly called King Edward's Schools, out of tithes that formerly belonged to religious houses or chantry lands; and many of these schools, owing to the improved value of their property, are now among the richest foundations of the kind in England. In these, as in many other grammar-schools, a certain number of persons were incorporated as trustees and governors, and provision was made for a master and usher. At that time the endowments varied in annual value from twenty to thirty and forty pounds per annum.

A large proportion of the grammar-schools were founded in the reigns of Edward VI. and Elizabeth, and there is no doubt that the desire to give complete ascendency to the tenets of the Reformed Church was a motive which weighed strongly with many of the founders. Since the reign of Elizabeth we find grammar-schools occasionally established, but less frequently, while endowments for schools not grammar-schools have gradually increased so as to be much more numerous than the old schools. Foundations of the latter kind are still made by the bounty of individuals from time to time; and a recent act of parliament (2 & 3 W. IV., c. 115) has made it lawful to give money by will for the establishing of Roman Catholic schools. The statute of the 9th Geo. II., c. 36, commonly called the Mortmain Act, has placed certain restrictions on gifts by will for *charitable* purposes, which restrictions consequently extend to donations by will for the establishment or support of schools. [Mortmain.]

The history of our grammar-schools before the Reformation would be a large part of the history of education in England, for up to that time there were probably no other schools. From the time of the Reformation, and particularly till within the last half century, the grammar-schools of England were the chief places of early instruction for all those who received a liberal training. From these often humble and unpretending edifices has issued a series of names illustrious in the annals of their country—a succession of men, often of obscure parentage and stinted means, who have justified the wisdom of the founders of grammar-schools in providing education for those who would otherwise have been without it, and thus securing to the state the services of the best of her children. Though circumstances are now greatly changed, there is nothing in the present condition of the country which renders it prudent to alter the foundation of these schools to any great extent; and certainly there is every reason for supporting them in all the integrity of their revenues, and for labouring to make them as efficient as their means will allow. In the conflict of parties who are disputing about education, but in fact rather contending for other things, in the competition of private schools, which from their nature must be conducted by the proprietor with a view to a temporary purpose, and in the attempt made to form proprietory establishments which shall combine the advantages of grammar-schools and private schools, and shall not labour under the defects of either—we see no certain elements on which to rest our hopes of a sound education being secured to the youth of the middle and upper classes of this country. The old grammar-schools, on the whole, possess a better organization than anything that has yet been attempted, and though circumstances demand changes in many of them, they require no changes which shall essentially alter their character. In the present state of affairs, these are specially the schools for the middle classes, and it is their interest to cherish and support them.

The voluminous Reports of the Commissioners appointed to inquire into Charities contain, as already observed, the most complete accessible information on the several schools which were visited by the commissioners. But this vast mass of materials is only useful for those who wish to inquire into some particular endowment, or for the few who have leisure to study the Reports and the knowledge necessary to enable them to make a right use of them. A good deal has been written on the subject of endowments for education from time to time. There are several articles on endowed schools in the 'Journal of Education,' and an article on endowments in England for the purposes of Education, in the second volume of the publications of the Central Society of Education, by George Long. The evidence before the select committee of the House of Commons in 1835, contains much valuable information. In 1840 a sensible pamphlet on grammar-schools appeared in the form of a letter to Sir R. H. Inglis, by the Honourable Daniel Finch, for twenty years a charity commissioner. We are indebted to this letter for several facts and suggestions.

SCHOONER. [Ship.]

SCHOOTEN, FRANCIS, a Dutch mathematician of the seventeenth century, of whose life scarcely any particulars have been preserved. He was professor of mathematics at Leyden, and was one of the young philosophers, chiefly natives of Holland, who, rising superior to the prejudices of the age in favour of the antient geometry, contributed most to the establishment and promotion of what was then called the New analysis—the algebra of Descartes and the infinitesimal calculus.

In 1646 he published a small tract on conic sections, in which are given several ways of describing those curves by a continuous motion; and in 1649 he gave to the world a Latin translation, accompanied by a learned commentary, of the geometry of Descartes. Ten years afterwards he published, with numerous additions, a second edition of the commentary in two volumes. This work has met with general approbation, as it presents a clear explanation of the subject without the prolixity which usually accompanies the writings of a commentator; it is also enriched with the researches of several distinguished mathematicians of the age. It contains two letters from Hudde (burgomaster of Amsterdam) on the reduction of equations, on the method of tangents, and on propositions concerning maxima and minima; and one from Van Heuraet on the rectification of curves. There are also two tracts by M. Beaune on the limits of equations, and one entitled 'Elementa Curvarum,' by the unfortunate minister De Witt.

In 1651 he published his 'Principia Matheseos,' and in 1657 his 'Exercitationes Mathematicæ.' The latter work, which is now scarce, contains, besides the solutions of several curious and intricate propositions, many useful and instructive applications of algebra to geometry, particularly a restoration, in part and in an algebraic form, of the treatise on 'Plane Loci,' from the works of Apollonius.

The year of Schooten's birth is not known, but he died in 1659, while the second volume of the commentary above mentioned was in the press.

SCHOPS. [OWLS.]

SCHOREL, or SCHOREEL, JOHN, was born in 1495, at Schorel, a village near Alkmaar in Holland. His parents dying when he was very young, he was put to school by some near relations; and as he very early manifested a decided inclination for the art of design, they placed him, at the age of fourteen, under William Cornelis, an indifferent painter, with whom he remained three years, and made much greater progress than might have been expected. He afterwards studied under James Cornelis at Amsterdam, a much abler artist, who took great pains to instruct him. The fame of John de Mabuse, who was living in high esteem at Utrecht, induced Schorel to place himself under him; but he was soon obliged to leave him, on account of his dissolute manners, which disgusted the young artist. He then travelled through Germany, and passed some time at Nürnberg with Albert Durer, who treated him with great kindness. He next went to Venice, where he met with an ecclesiastic, his countryman, who persuaded him to join a company of pilgrims to the Holy Land. In Palestine he made numerous sketches of Jerusalem and the environs of the country about Jordan, and whatever appeared worthy of his attention. On his way to the Holy Land he landed at Cyprus; and on his return, at Rhodes, where he was received with much distinction by Villiers, the grand-master of the knights of St. John. In these islands he likewise enriched his portfolio with numerous sketches, which were of great use to him in his future compositions. On returning to Europe he passed three years at Rome, studying the works of Raphael and other great masters and the antique. He was the first of the artists of the Netherlands who introduced the Italian taste into his own country. He settled at Utrecht. His works were very numerous, and are spoken of in the highest terms of praise, among which the Baptism of Christ, Christ's Entry into Jerusalem, the Passage of the Israelites over Jordan, and some others, are particularly mentioned. Unfortunately all his great works in the churches and convents were destroyed by the fanatical Iconoclasts, in 1566, only four years after his death. Though many in private collections escaped destruction, his works are now excessively scarce. In the collection of old paintings made by Messrs. Boisserée, now in the possession of the king of Bavaria, are four of his pictures; and in Lord Methuen's gallery at Corsham House there is one, of which Dr. Waagen speaks in high terms of praise, and adds, that it is the more valuable as a genuine work of that celebrated master, no well authenticated performance of whom has hitherto been anywhere found. Dr. W. has probably not seen the four above mentioned. Schorel, who, besides his eminence as a painter, was one of the most accomplished men of his time, died at Utrecht, in 1562, in the sixty-eighth year of his age. (Pilkington; Bryan; Johanna Schopenhauer *I van Eyck und seine Nachfolger.*)

SCHOTT, ANDREW, was born on the 12th of September, 1552, at Antwerp. He studied at Louvain, where he afterwards taught rhetoric. But the disturbances in the Netherlands obliged him to withdraw; and about 1577 he went to Paris, where for some time he assisted Busberq in his literary occupations. After a stay of two years in France he went to Spain, where he became acquainted with some persons of influence at the court of Philip II., in consequence of which he obtained a professorship of Greek literature at Toledo. Schott gained so high a reputation, that in 1584 he was invited to the professorship of Greek and rhetoric in the university of Saragossa. In 1586 he entered the order of the Jesuits, and in consequence of this began the study of theology, which he subsequently taught at Saragossa, until he was invited to Rome as professor of rhetoric in the college of the Jesuits. Here he remained for three years, and at the close of this period he asked and obtained permission to return to Antwerp. The remainder of his life he spent at Antwerp, devoting himself entirely to literary pursuits. He died on the 23rd of January, 1629

Schott was a man of great industry and sincerity: he was kind and obliging to all persons, whether Catholic or Protestant, his only object being to advance the interests of learning and science. As a scholar he is more remarkable for his great and accurate learning than for his genius or critical talents. His works amounted to the number of 47: we shall only give a list of the more important among them. 'Laudatio Funebris Ant. Augusti, Archiep. Tarraconensis, in qua de ejus Vita Scriptisque disseritur,' Leyden, 1586, 4to.; 'Vitæ Comparatæ Aristotelis ac Demosthenis, Olympiadibus ac Præturis Atheniensium digestæ,' Augsburg, 1603, 4to.; 'Hispania Illustrata, seu rerum urbiumque Hispaniæ, Lusitaniæ, Æthiopiæ et Indiæ Scriptores varii,' Frankfort, 1603, 1618, 4 vols. fol.: the first two vols. of this very important work were edited by Schott himself, the third by his brother, and the fourth by Pistorius. 'Thesaurus Exemplorum ac Sententiarum ex Auctoribus Optimis collectus, in centurias quatuor divisus,' Antwerp, 1607, 8vo.; 'Hispaniæ Bibliotheca, seu de Academiis et Bibliothecis, item Elogia et Nomenclator Clarorum Hispaniæ Scriptorum, qui Latine Disciplinas omnes illustrarunt,' Frankfort, 1608, 4to.: this work, though of great value for the literary history of Spain, has many defects; and as the author's name does not appear on the title-page, it has been thought that the work was not written by Schott himself. 'Adagia, sive Proverbia Græcorum ex Zenobio, Diogeniano, et Suidæ collectaneis partim edita, partim nunc primum Latine reddita; accedunt Proverbiorum Græcorum e Vaticana Bibliotheca Appendix et Jos. Scaligeri Stromateus,' Antwerp, 1612, 4to.; 'Observationum Humanarum Libri Quinque, quibus Græci Latinique Scriptores emendantur et illustrantur,' &c., Hanau, 1615, 4to.: 'Tabulæ Rei Nummariæ Romanorum Græcorumque ad Belgicam, Gallicam, &c. monetam revocatæ, cum brevi Catalogo eorum qui apud Græcos Latinosque de Ponderibus, Mensuris et Re Nummaria scripserunt,' Antwerp, 1616, 8vo.; 'Selecta Variorum Commentaria in Orationes Ciceronis,' Cologne, 1621, 3 vols. 8vo. Schott also took a part in the edition of the 'Bibliotheca Patrum,' which appeared at Cologne in 1618, &c. He also published editions of several antient writers, such as Aurelius Victor, Pomp. Mela, Orosius, St. Basilius, Theophylactes, and wrote notes upon Valerius Flaccus and Corn. Nepos. He also edited, with additions, the 'Annales Romani' of Pighius, the 'Itinerary' of Antoninus, Goltzius's 'History of Sicily,' Rosini's 'Antiquitates Romanæ,' and the 'Lettres' of Paul Manutius.

SCHRECKHORN. [ALPS.]

SCHREVE'LIUS, CORNE'LIUS, was born at Haarlem in South Holland, about the year 1615. He was brought up as a physician, but it is not stated if he ever practised this profession, and he is only known by his literary labours. In 1662 he succeeded his father as rector of a school at Leyden, which place he held till his death in 1664, according to some, or in 1667 according to others. Schrevelius published editions of many of the Latin classical writers with notes collected from various critics; Juvenal, Persius, Terence, Virgil, Horace, and Cicero are among the number. He also published a Hesiod and Homer in the same way. He also edited the 'Lexicon' of Scapula, and that of Hesychius which bears date the year 1668, after the death of Schrevelius, as appears from the dedication of the printer. Schrevelius is best known by his 'Lexicon Manuale Græco-Latinum,' the fourth edition of which is said to have appeared in 1645. Works of this kind should be estimated by the period to which they belong, and in this view the 'Lexicon Manuale' had the merit of furnishing the young scholar with a cheap dictionary of the Greek language. This dictionary however is of very limited use, as it is only applicable to a few authors. Perhaps few school-books have been more extensively used; the editions both English and foreign are innumerable. The work is still used in the schools of this country, but as it is formed on a plan fundamentally bad, and is full of errors of all kinds, it has long been one of the obstacles to the acquisition of a sound knowledge of the Greek language.

SCHULTENS, ALBERT, a learned divine, was born at Groningen, in 1680. He studied at that place till 1706, and made rapid progress in theology, Hebrew, Syriac, and Arabic. He then visited Leyden, and attended the lectures of the most eminent professors at that university. Thence he passed to Utrecht, where he met Reland and profited by his lessons. On his return to Groningen in 1708, Schultens took holy orders, and in 1711 became curate of

Wassenaar. Two years after he was appointed professor of the Oriental languages at Franeker, where he remained till 1720. He was then invited to Leyden, where he taught Hebrew and the Oriental languages with great reputation till his death, which happened on the 26th January, 1750, in the 64th year of his age. He left a son, named John Jacob, who was professor of divinity at Herborn, and who afterwards succeeded him in the chair of Oriental languages at Leyden. Schultens published several works on various subjects connected with Biblical or Oriental literature. The principal are: 'Commentarius in Librum Job, cum novâ versione,' Leyden, 1737, 2 vols. 4to.; 'Vetus et regia via Hebraïzandi contra novam et metaphysicam hodiernam,' ib., 1738, 4to.; 'Origines Hebreæ,' Franeker, 1724-38, 2 vols. 4to. In these last two works Schultens upholds the doctrine that the Hebrew, Arabic, Syriac, and Chaldee are only the remains of a more antient language taught to man by his Creator; and refutes the opinions of Gousset and his disciples, who maintained the divine origin of the Hebrew. 'Proverbia Salomonis cum versione integrâ et commentario,' Leyden, 1748, 4to.; 'Monumenta vetustiora Arabiæ,' ib., 1740, 4to., or a collection of poetical fragments of the times preceding Mohammed, as preserved in the works of Nuwayrí, Masúdí, Abú-l-fedá, &c., with a Latin translation and copious notes. He published also the 'Life of Saladin,' by Boháu-d-dín, in the original Arabic, with a Latin translation, and an excellent geographical index, Leyden, 1755, folio; a portion of the *Makamát*, or sessions of Harirí; and a new edition of Erpenius's Arabic Grammar, with numerous additions. A short account of the life and writings of Schultens may be read in the 'Athenæ Frisiacæ,' by Vriemoet.

SCHULTENS, HENRY ALBERT, grandson of the preceding, was born at Herborn, 15th February, 1749, at the time when his father (John Jacob) was professor of divinity at that place. He was educated at Leyden, where he applied himself with great diligence to the study of Hebrew and Arabic under his father and Everard Scheid, who then lodged at his house. He also studied the Greek and Latin classics under Hemsterhuis, Rhunkenius, and Walkenaar, and cultivated English literature, being remarkably fond of Pope and an enthusiastic admirer of Shakspere. In 1722, when he was only in his twenty-third year, he published his 'Anthologia Sententiarum Arabicarum' (Leyden, 4to.), with a Latin translation and notes. Shortly after he visited England, for the purpose of consulting the Arabic MSS. in the Bodleian Library, and resided for some time at Oxford as a gentleman commoner of Wadham College. In May, 1773, the University conferred on him the degree of M.A. by diploma. He also visited Cambridge, and made several corrections and additions to the catalogue of the Oriental MSS. in the University Library. During his stay in England, Schultens published his 'Specimen Proverbiorum Meidani ex versione Pocockianâ' (1773, 4to.), which he had transcribed while at Oxford from the original manuscript of Edward Pocock, preserved in the Bodleian. On his return to Holland, Schultens was appointed professor of Oriental languages in the academical school of Amsterdam, where he remained for five years, until, in December, 1778, he was called to succeed his father in his chair, and in 1787 was elected rector of the university. At the expiration of his functions in 1788, he delivered his remarkable peroration 'De Ingenio Arabum,' which was afterwards printed. In November, 1792, he was attacked by a slow fever that terminated in a consumption, of which he died in August, 1793, at the age of forty-four.

Besides his Anthologia of Arabic sentences, and several articles in the 'Bibliotheca Critica,' edited by Wyttenbach (Amst., 1779-90), Professor Schultens wrote 'Pars versionis Arabicæ Libri Colaïlah wa Dimnah,' Leyden, 1786, 4to., or the Arabic translation of the Fables of Bidpay, or Pilpay, made by Abdalla Ibn Mokaffa. [Bidpay.] 'Meidanii Proverbiorum Arabicorum pars, Latinè cum notis,' ibid., 1795, 4to. This work, which is different from that published in 1773, was not printed till after the death of the author, by the care of his friend Nicholas William Schröder. It contains only a portion of the proverbs of Meydani, of the whole of which Schultens had made a translation. 'De Finibus Litterarum Orientalium Proferendis,' Amst., 1774, 4to. 'De Studio Belgarum in Litteris Arabicis Excolendis,' Leyd., 1779. These are two inaugural orations read on the occasion of his taking possession of the chairs which he filled at Amsterdam and Leyden. He left also a Dutch translation of the Book of Job, which has never been printed. The life of Henry Albert Schultens, accompanied by his portrait, appeared in Wagenaar's collection, entitled 'Series Continuata Historiæ Batavæ,' part i., pp. 364-80.

SCHULTING, ANTONIUS, was born at Nymegen in Guelderland, in 1659. He received a learned education under Rycquius and Grævius, and afterwards studied law at Leyden under Voet, and under Noodt, to whom he was related. After being employed as a teacher of law in his native province and also in Friesland, he was removed to the university of Leyden in 1713, where he became the colleague of Noodt. He died at Leyden in 1734. Schulting was a laborious student, and he had a right perception of the necessity of studying Roman law in its historical development. Besides some orations delivered on public occasions, he wrote 'Enarratio partis primæ Digestorum, Leyden, 1720, 8vo.; 'Thesium Controversarum juxta seriem Digestorum decades C.,' Leyden, 1738, 8vo.; and 'Notæ ad Veteres Glossas Verborum Juris in Basilicis,' inserted in the third volume of the Thesaurus of Otto. But the work by which he is best known is the 'Jurisprudentia Vetus ante-Justinianea' (Lugd. Bat., 1717, and Lips., 1737), which contains the remains of the four books of the 'Institutiones' of Gaius, the 'Sententiæ Receptæ' of Paulus, the twenty-nine 'Tituli ex Corpore Ulpiani,' the fragments of the 'Codices Gregorianus et Hermogenianus,' the 'Mosaicarum et Romanarum Legum Collatio,' and some few other matters. Though this work has been superseded either altogether or in part, so far as regards the text, by the 'Jus Civile ante-Justinianeum,' &c., published at Berlin in 1815, by the 'Corpus Jur. Rom. ante-Justinian.,' &c., Bonn, 1835 and 1837, and by the various discoveries and labours of more recent jurists, it is still very valuable for the learned notes of Schulting and other scholars which accompany it.

SCHULTZE, ERNST CONRAD FRIEDERICH, a young German poet, no less remarkable for the enthusiasm of his character, and for the peculiar application of his genius, than for his genius itself. He was born at Celle, March 22nd, 1789, and was so far from giving early indications of a studious disposition, that while at school he was considered exceedingly negligent and wayward, and impatient of restraint or order. Neither did he distinguish himself by diligence at the University of Göttingen, whither he proceeded in 1806; for though he gained the notice and friendship of Professor Bouterwek, by the superiority of his college exercises, and by the talent displayed in the poetical compositions he ventured to submit to his criticism, he benefited little by the public lectures he attended, even those on classical and modern literature. A year or two before going to the university he had indulged in reading romances of chivalry and legends of fairy fiction, of which he had met with an ample store in an old library to which he had access, and their influence is plainly perceptible in his productions. The first was a poem, composed by him while at Göttingen, on the story of Psyche, in which he seems to have proposed to himself Wieland as his model, and in which he caught the charming style and versification of that master.

Had he prosecuted the career thus begun at the age of eighteen, he would probably have become one of the most popular as well as the most gifted of German poets. Circumstances however converted him into a visionary enthusiast. He conceived a deep attachment for an amiable and accomplished girl, named Cecilia, the daughter of one of the professors; and her death, within a year or two afterwards, left him inconsolable. He resolved to immortalise his passion and her name and perfections: accordingly, with only an interval during which he served as a volunteer in the war of 1813-14, he applied himself to the composition of 'Cecilia,' a romantic poem in twenty cantos, completed by him in December, 1815. Unfortunately the intensity of his own feelings overpowered his judgment; for the plan of the work is so complex, and so wild and improbable, that the fancy and genius displayed in it have been wasted upon a subject which scarcely any poetical power could invest with interest for the public. It is rich in striking scenes and incidents, in beautiful details, in graceful imagery, in harmonious versification; but it is wanting in that which fixes attention, and which is especially required in a work of such length. It is impossible not to admire the talent which it displays, and it is equally impossible not to regret that it should have been so ill applied.

His subsequent romantic poem, 'Die Bezauberte Rose, or 'Enchanted Rose,' in three cantos, in regular *ottava rima*, which obtained the prize offered by the publishers of the 'Urania' for the best production of the kind, and first published in that pocket-book, 1818, is the production by which he will continue to be known. It has already passed through several editions, and may now be considered a standard work of its class in German literature. The poet himself however did not live to enjoy the honour it conferred upon his name; for after having been long in a gradually declining state, he died at his father's house at Celle, June 22nd, 1817, the victim of consumption, but also of morbid and overstrained feeling, and of a passion that 'loved not wisely, but too well.' A collection of his poems and literary remains was published by his friend and instructor Bouterwek, in 4 vols. 8vo.

SCHUMLA. [SHUMLA.]

SCHWABACH is a thriving manufacturing town of Bavaria, in the circle of Middle Franconia (formerly the circle of the Rezat), on both banks of the river of the same name, which falls into the Regnitz at Erlangen. It is a well built town surrounded with walls, with four gates, and has 1 French Protestant and 2 Lutheran churches, 2 chapels, a synagogue, an hospital, a lunatic asylum, a well regulated house of corfection, and a poor-house. There are numerous manufactories, several of which were established by French refugees, who settled here in 1686, after the revocation of the Edict of Nantes. The principal are those of cotton and of needles. The latter produces every week 4,000,000 common needles, 100,000 English darning, packing, and other needles, and employs about 500 workmen. There are also manufactures of gold and silver lace, gold and silver articles, stockings, tobacco, paper, hats, sealing-wax, soap, and many others. The breweries are considerable. The number of inhabitants is nearly 8000, who have a profitable export trade in their own manufactures.

It is probable that the Italic type, called Schwabach type, was invented in this town, which was employed by the printers at Mainz soon after 1480. The Schwabach Articles are the confession of faith of his party, drawn up by Luther for the assembly of German Protestant princes and cities, at Schwabach, in October, 1529, which the cities of southern Germany, adhering to the Swiss doctrine, would not subscribe, on account of the strongly expressed opinion of Luther of the real presence of Christ in tho Lord's Supper. These articles, which were adopted by the confederates at Schmalkalden, were a chief obstacle to the union of the parties of Luther and Zwingli. (Stein; Hassel.)

SCHWARZ, CHRISTIAN FRIEDRICH, was born Oct. 26, 1726, at Sonnenburg, in the Prussian province of Brandenburg. He was educated at the schools of Sonnenburg and Cüstrin till his twentieth year, when he entered the University of Halle, where he obtained the friendship of Herman Francke, who was a warm supporter of missionary labours. Schwarz and another student were appointed to learn the Tamul, in order to superintend the printing of a Biblo in that language, which however was not carried into effect; but the knowledge of the Tamul which Schwarz had acquired induced Francke to propose to him that he should go out te India as a missionary. Schwarz had been educated with a view to the Christian ministry: his own religious impressions had early seconded the wishes of his father, and the proposal of Francke was immediately acceded to. Having been ordained at Copenhagen, he embarked at London, Jan. 21, 1750, and in July arrived at Tranquebar, on the Coromandel Coast, the appointed scene of his labours, and the seat of a Danish mission.

Schwarz continued to reside chiefly at Tranquebar, and to labour with the Danish mission till 1766, when he devoted his services to the Society for Promoting Christian Knowledge, to which the Danish mission was soon afterwards transferred. He now took up his abode at Trichinopoly, where he had founded a church and school in 1765. Here he performed the duties of chaplain to the garrison, for which he received 100*l*. a year, a sum which he devoted entirely to the service of the mission.

Schwarz continued to reside for several years at Trichinopoly, occasionally visiting other places, especially Tanjore. Small congregations of Hindu converts gradually grew up under his care, and in 1777 another missionary was sent from Tranquebar to assist him. His visits to Tanjore now became more frequent, and he obtained the friendship of the raja Tulia Maha, who gave him leave to build a church in Tanjore. He proceeded with the work till his funds were exhausted, when he applied to the presidency of Madras for assistance. In reply he was requested to proceed immediately to the seat of government in order to receive the appointment of ambassador, for the purpose of treating with Hyder Ali for the continuance of peace, a task to which he was summoned by Hyder himself. 'Do not send to me,' said Hyder, 'any of your agents, for I do not trust their words or treaties; but if you wish me to listen to your proposals, send to me the missionary of whose character I hear so much from every one: him I will receive and trust.' Schwarz was startled by the novelty of the proposal, but after requesting time to consider of it, he accepted the offer. He proceeded to Seringapatam, and resided at the court of Hyder for three months. His mission was entirely successful; the terms of the peace were settled, and he then returned to Tanjore.

The peace however was of short continuance, and Schwarz complained that the British were guilty of the infraction. Hyder invaded the Carnatic, and during the years 1781, 1782, and 1783 the sufferings of the inhabitants were dreadful; they fled to the towns for protection; Tanjore and Trichinopoly were crowded with starving multitudes; at Tanjore especially numbers died in the streets of famine and disease, and the garrison itself was enfeebled by want, and dispirited by knowing that a powerful army was outside the walls. There were provisions in the country, but the exactions both of the British and the Raja bad destroyed the confidence of the cultivators, and they would not bring them to the fort. At length the Raja said, 'We all have lost our credit. Let us try whether the inhabitants will trust Mr. Schwarz.' Schwarz was accordingly empowered to treat with tho cultivators. He sent out letters, in which he promised not only to pay for what was brought in, but for any bullock which might be taken by the enemy. In two or three days a thousand bullocks were obtained, and in a short time 80,000 kalams of grain. By this means the town was saved.

In 1784 the East India government sent Schwarz on a mission to Tippoo Saib, but the son of Hyder would not receive him. Another church was built in the neighbourhood of Tanjore, which the increase of his congregation had rendered necessary; and in 1785 he engaged in a scheme for the establishment of schools throughout the country for the purpose of teaching the natives the English language, which was carried into effect at Tanjore and other places, and tho good faith and good sense with which Schwarz conducted them, no 'deceitful methods' being used to bring over the pupils, who were chiefly children of the upper classes, to the doctrines of Christ, proved highly beneficial not only from the instruction and moral principles communicated, but from the confidence and good feeling which were created in the natives generally.

In 1787 the Raja of Tanjore lay at the point of death. He had adopted as his successor a boy yet in his minority and now sent for his friend Schwarz as the only person to whom he could with confidence entrust him. 'He is not my son, but yours,' said the dying Raja; 'into your hands I deliver him.' Ameer Sing, brother of Tulia Maha, was appointed regent and guardian; but he was disposed to be treacherous, and he was supported by a strong British party; so that it required all Schwarz's care and influence with the East India Company to establish the young prince in the possession of his inheritance. Maha Sarbojee, the raja, some years afterwards manifested his filial affection for his tutor and protector by erecting a monument to his memory in the mission church at Tanjore, on which the Raja is represented as grasping the hand of the dying saint, and receiving his blessing. The monument is by Flaxman. The success of Schwarz in the education of his pupil is shown by the terms in which Bishop Heber spoke of him (the Raja) in 1826. Heber calls him 'an extraordinary man,' and says that he quoted Fourcroy, Lavoisier, Linnæus, and Buffon fluently, that he had formed an accurate judgment of the merits of Shakspere, that he wrote tolerable English poetry, and was 'respected by the English officers in the neighbourhood as a real good judge of a horse, and a cool, bold, and deadly shot at a tiger.' Heber sums up his description by remarking that 'he looked and talked like a favourable specimen of a French general officer.'

Schwarz died February 13, 1798. Besides the monument already mentioned, which the Raja sent a commission to Flaxman to execute, another by Bacon was sent out by the East India Directors, and was erected in St. Mary's church at Madras.

For several years Schwarz's labours in the conversion of the Hindus were apparently attended with little success, which was not owing to persecution or opposition, but almost entirely to the peculiar mental character of the natives of India, cool, subtle, fond of argument, and slow to be convinced; but the effect of his preaching and the influence of his virtuous and disinterested life were attended by a slow but steady advance of the cause of Christianity. Congregations were formed in numerous villages, and preachers were established at Caddalore, Negapatam, and other towns, besides those at the earlier stations of Tranquebar, Trichinopoly, and Tanjore. The memory of Schwarz is regarded with a feeling of veneration both by Mohammedans and unconverted Hindus, as well as by the Christian converts. Bishop Heber says of him, that 'he was one of the most active and fearless, as he was one of the most successful missionaries who have appeared since the Apostles. To say that he was disinterested in regard of money is nothing; he was perfectly careless of power, and renown never seemed to affect him, even so far as to induce an outward show of humility. His temper was perfectly simple, open, and cheerful, and in his political negotiations (employments which he never sought, but which fell in his way) he never pretended to impartiality, but acted as the avowed though certainly the successful and judicious agent of the orphan prince committed to his care.'

(*Gallery of Portraits*; Heber's *Journey through the Upper Provinces of India*.)

SCHWARZBURG is a German principality consisting of two considerable portions detached from each other, of which the southernmost is called the Upper County and the northernmost the Lower County. The Upper County lies on the north side of the Thüringer Wald, between 50° 34′ and 50° 55′ N. lat., and between 10° 50′ and 11° 20′ E. long. It is bounded by the Prussian territory and the Saxon duchies, and is traversed by the rivers Gera, Saale, Ilm, and Schwarze. The Lower County lies between 51° 13′ and 51° 25′ N. lat., and between 10° 30′ and 10° 17′ E. long. It is almost surrounded by the Prussian territories, but on the south-west it borders on Gotha, and on the south-east on Weimar. It is watered by the rivers Wipper and Helbe. The total area of the two counties is 745 square miles, and the number of inhabitants is 112,000, who, with the princes, are of the Protestant religion, excepting about 350 Roman Catholics and 200 Jews. The surface of the country is diversified with mountains, valleys, and plains, and is on the whole fertile. The Lower County is however more productive than the Upper, which is traversed by a part of the Thüringer Wald. In the Lower County is the Kyffhäuser, 1458 feet high, and the Hainleite, a wooded mountain-chain which begins at the river Unstrutt and extends eight leagues to the west. The natural productions are corn, fruit, potatoes, flax, and pulse. The forests furnish timber for every purpose, and abound in game. The mineral productions are silver, copper, iron, lead, vitriol, sulphur, alum, saltpetre, salt, marble, alabaster, freestone, slate, potters'-clay, porcelain-clay, and lime. The inhabitants have most of the usual domestic animals. Oxen and swine are numerous, and of late years the breeding of sheep has been much attended to.

The family of the princes of Schwarzburg is very antient, and is mentioned in the earliest period of the middle ages. It is now divided into two branches, Rudolstadt and Sonderhausen, each of which has a part both of the Upper and the Lower County.

Schwarzburg-Rudolstadt has a territory of 400 square miles in extent, with 60,000 inhabitants, and a revenue of 180,000 dollars. In the Upper County the prince has the lordship of Rudolstadt, including the capital, a well-built town in a valley on the Saale, the residence of the prince and the seat of government. Within the walls is Ludwigsburg, the prince's palace, which contains some considerable scientific collections. There are in Rudolstadt two churches, a gymnasium, a theological seminary, and 4100 inhabitants, who manufacture some cloth and flannel, and carry on a little trade. In the Lower County the prince of Rudolstadt possesses the lordship of Frankenhausen, the capital of which, of the same name, situated on an arm of the Wipper, has two churches within the walls, and two without, a palace, a Latin high school, and 4700 inhabitants.

Schwarzburg-Sonderhausen has a territory of 345 square miles in extent, and 52,000 inhabitants. In the Lower County, the prince has the lordship of Sonderhausen, with the capital of the same name, which is situated in a pleasant valley on the Wipper. The palace, situated on an eminence, contains a good cabinet of natural history. The town has a theatre, a gymnasium, an orphan asylum, an hospital, and other public institutions. The population is 4000. In the Upper County, the prince has the lordship of Armstadt. This town has also a palace of the prince, a gymnasium, 4 churches (of which that of the Virgin Mary is a valuable monument of the antient German style), 2 hospitals, and 5000 inhabitants, who have some trade in timber and corn, and considerable breweries. The public revenue amounts to 325,000 florins. Both provinces belong to the German confederation; they have, with Oldenburg and Anhalt, the fifteenth place in the select council, and in the full council one vote each. The contingent of Sonderhausen to the army of the Confederation is 451 men, and that of Rudolstadt 539 men; they form part of the reserve division. Each contributes 200 florins annually to the chancery of the Confederation. Rudolstadt has had ever since 1816 a representative constitution with an assembly of the states, consisting of 18 deputies. The prince of S. Sonderhausen is not limited by a constitution, that which was proposed in 1831 having been rejected by the Upper County.

SCHWARZENBERG is a lordship in Middle Franconia (late the circle of the Rezat), in the kingdom of Bavaria, from which the princes of Schwarzenberg take their title. This illustrious family is one of the most antient of the noble houses of Franconia, and has the same origin as that of the counts of Seinsheim. Erkinger von Seinsheim purchased, in 1420, the county of Schwarzenberg, of which he assumed the name and title. He died in 1427, and his family was divided into the two houses of Schwarzenberg and Seinsheim. Adolphus von Schwarzenberg was raised, in 1599, by the emperor Rudolf II., to the dignity of count of the empire, as a reward for his bravery in the wars with the Turks. His grandson John Adolphus was raised by Leopold I., in 1670, to the rank of prince of the empire, and the county to that of a principality. In 1698 this family obtained by inheritance the landgraviate of Klettau, in Swabia, and in 1723 Prince Adam Francis was elevated to the rank of Duke of Krumau in Bohemia. By an imperial diploma of December 8, 1740, the princely dignity was extended to all the male and female descendants of the family. In 1806 the principality of Schwarzenberg and the landgraviate of Klettau were mediatised, and the latter was sold in 1813 to Baden. The present possessions of the family, which is of the Roman Catholic religion, are the county or principality of Schwarzenberg, 105 square miles in extent, with 10,000 inhabitants; in Swabia it possesses the county of Illereichen and Kellmünz; and several lordships, 30 square miles, with 3500 inhabitants, under Bavaria, Würtemberg, and Baden. The other possessions are in the Austrian dominions: 1, the duchy of Krumau, in Bohemia, contains 45,000 inhabitants, and 336 square miles; 2, the lordship of Muran, in Styria, 21 square miles, and 2000 inhabitants; 3, sixteen lordships in Hungary, 440 square miles, with 65,000 inhabitants. These possessions are now divided between two families: the first has the estates in Franconia and Swabia, and the duchy of Krumau and 20 lordships in Austria, with a revenue of 600,000 florins; the other has the remaining possessions, with a revenue of 100,000 florins.

SCHWARZWALD. [Germany.]

SCHWARZWALD, one of the four circles of the kingdom of Würtemberg, derives its name from the principal range of mountains, the Schwarzwald, or Black Forest. It is situated between 47° 55′ and 48° 55′ N. lat., and between 8° 15′ and 9° 15′ E. long., and is bounded on the north by Baden, on the north-east by the circle of the Neckar, on the east by the circle of the Danube and by Hohenzollern, and on the south-east, south, and west by the grand-duchy of Baden. Its area is 1840 square miles, with 425,000 inhabitants, of whom nearly three-fourths are Protestants, one-fourth Roman Catholics, and 1600 Jews. The face of the country is mountainous and woody. The Black Forest covers all the western part, and many offsets from it run into the interior, and on the east the Alb extends as far as Salz. The soil is much more stony and the climate more ungenial than in the circle of the Neckar. It is therefore more calculated for pasturage than for agriculture, and does not grow sufficient corn for the inhabitants.

a great part of whom subsist on potatoes, which are very abundant. Flax is a chief product of the circle; but its most valuable articles are the timber from the extensive forests and the fine breed of cattle, of both of which large quantities are exported. Game and fish abound, and the mineral kingdom yields iron, some salt, fine marble, and alabaster. Though this circle is inferior in its natural productions to that of the Neckar, it far excels it in manufacturing industry. There are not, it is true, any manufactories on a great scale; but the country-people spin yarn, thread, and worsted, and manufacture ticking, worsted stockings, caps, and muslin. This circle is the seat of the woollen manufactures. The tanneries are extensive. There are many paper and oil mills. The inhabitants prepare potashes, pitch, tar, and lampblack; they make wooden clocks and various wooden-wares. There are great iron-works and some glasshouses. The trade is chiefly retail. The exports are timber, cattle, yarn, and some manufactures. On the whole, the town of Kalw has more trade than any other place in this circle. The circle is divided into seventeen bailiwicks. [Calw; Reutlingen; Tübingen] Rothenburg, on the Neckar, with the old town or suburb of Chingen, has 6000 inhabitants; it is the see of the Roman Catholic bishopric of the kingdom. The town has broad streets and a spacious market-place; among the public buildings are a handsome town-house, 6 Roman Catholic churches, and several dissolved monasteries.

SCHWATZ is a large and handsome market-town in Tyrol, on the right bank of the Inn, in 47° 33′ N. lat. and 11° 40′ E. long. This town was founded in antient times, and owed its prosperity to the very rich silver, iron, and copper mines in its neighbourhood: these have however become much less productive. On the 15th of May, 1809, it was taken by the Bavarian troops under the command of Marshal Wrede, and set on fire: on that occasion 360 houses, two churches, two hospitals, and 45 barns were consumed. It has been partly rebuilt, and, according to Hassel (in 1819), handsomer than before; but Blumenbach, in 1836, and the 'Austrian National Encyclopedia,' 1838, say that it has never recovered since 1809, and that the population, which before that time was 8000, is now only 3000. It has a handsome parish church, which escaped the fire, as did also the Franciscan convent, in which there is a philosophical seminary of that order. The inhabitants derive their subsistence from the manufacture of cotton-yarn, stockings, cutlery, wire, and tobacco, of which there is a large manufactory belonging to the government. There are likewise one manufactory of smalt and one of verdigris. Many of the people find employment in the neighbouring silver and copper mines.

SCHWEIDNITZ, the capital of the principality of the same name, is situated in 50° 47′ N. lat. and 16° 30′ E. long., on the left bank of the Weistritz, in one of the most beautiful parts of Silesia. It was formerly one of the strongest fortresses in the Prussian monarchy, and sustained several memorable sieges in the Thirty Years' War. It was very much strengthened by Frederic II., was taken in 1757 by the Austrians, in 1759 by the Prussians, in 1781 by the Austrians, and afterwards recovered by the Prussians, in whose hands it remained till, after a wretched defence from the 16th of January to the 16th of February, 1807, it fell into the hands of the French, who blew up the greater part of the fortifications, which have not since been restored. The internal works however remain. Among the public buildings are two Roman Catholic churches, one of which is 327 feet high; two Lutheran churches, a convent of Ursuline nuns, an hospital, a poor-house, and an orphan asylum. There are in the town a Protestant gymnasium, a Protestant elementary school, a girls' school in the convent of the Ursuline nuns, and numerous private schools. The manufactures are woollen, linen, leather, starch, gloves, hats, silk, ribbon, and paper. The inhabitants have also three breweries, twenty-five distilleries, five vinegar manufactories, eight dye-houses, and twenty-two tanneries. The corn, cattle, and wool fairs are very much frequented. Not far from the town are copper-works. The population is 9476, besides the garrison.

SCHWEITZ. [Switzerland]

SCHWERIN, the capital of the grand-duchy of Mecklenburg Schwerin, is situated in 53° 45′ N. lat. and 11° 30′ E. long., on the west side of the lake of Schwerin. The external appearance of the town is very striking; the palace, the cathedral, the theatre, and some other fine buildings, and the great length of the town, give it a look of importance with which the interior by no means corresponds. The city is neither regular nor handsome, but the streets in the new town are straight and broad; those in the old town and the suburb, though the latter is of recent origin, are for the most part crooked and narrow. There are however some handsome public buildings: 1, the grand-ducal palace, situated on an island in the lake, is fortified, and communicates with the town by a drawbridge; the interior is fitted up in an antiquated style, but contains a fine picture-gallery and a museum; 2, a large building, said to be the finest modern edifice in Mecklenburg, for the public offices; it was commenced in 1825 and finished in 1835; 3, the theatre; 4, the cathedral, an old Gothic edifice 305 feet in length, 135 in breadth, and of considerable height; 5, the town-house. Besides the cathedral, there are two other Lutheran churches, a Roman Catholic church, and likewise a synagogue. There are a gymnasium, a veterinary school with a remarkable collection of anatomical preparations, a lunatic asylum, a Bible Society; many distilleries and vinegar manufactories, and some manufactories of cloth, pottery, and tobacco; they are not however of much importance. The number of inhabitants is about 13,000, of whom a considerable proportion are of the poorer class, for whom there are several well-endowed charitable institutions.

SCHWYZ, one of the cantons of the Swiss confederation, which has given its name to all Switzerland, called 'Schweiz' in German. The canton called Schwyz is the wealthiest and most populous of the three Waldstätten, or forest cantons (Uri and Unterwalden are the other two), which were the first to assert their independence, in January, 1308, and to form a confederacy, which repulsed the force of the house of Austria at Morgarten; the men of those cantons became known by the name of Schwyzern or Schweizern, which name continued to be applied to the Confederation in general after it was enlarged by the successive junction of other cantons; and lastly, the whole country formerly known in the Roman times by the name of Helvetia has been called Schweiz or Schweizerland. The early history of the canton of Schwyz is given under Switzerland.

The canton of Schwyz lies on the west side of the high Alps of Glarus, of which the Glärnisch, 9000 feet high, is the loftiest summit. It consists of several long valleys between lower offsets of the Alps, the summits of which are from 4000 to 6000 feet high, and of a plateau or table-land in the centre of the canton. The principal valleys are the Wäggi Thal in the north, the Sihl Thal in the middle, and the Muota Thal in the south. The waters of the northern part of the canton of Schwyz run in a north direction into the lake of Zürich; those of the central part flow north-west by the river Sihl into the Limmat; and those of the southern part run southwards into the Waldstätten lake. Besides bordering on those two lakes, the canton embraces within its territory the southern part of the lake of Zug, and it also entirely encloses the small lake of Lowerz, which is about two miles long and one mile wide, and the waters of which have an outlet southward into the Waldstätten See. The small island of Schwanau, on which are the ruins of a feudal castle, rises in the middle of the lake. North-west of the lake of Lowerz, and between it and the lake of Zug, is the valley of Goldau, between Mount Rigi and the Rossberg. On the 2nd of September, 1806, an enormous fragment of the Rossberg detached itself from the mountain and rolled down into the valley, which it covered, destroying the villages of Goldau, Röthen, and Busingen. One hundred and ten houses, four hundred and fifty-seven persons, and two hundred and five head of horned cattle were buried under the ruins. Most of the cattle which were out in the fields ran away in time, and flocks of birds fled across the valley to the Rigi previous to the fall. The loss of property, including the land, which was very fertile, especially in pasture, has been valued at two millions of francs. The country still exhibits all the marks of this destruction.

The canton of Schwyz is bounded on the east by the canton of Glarus; north-east by St Gall, from which it is separated by the river Linth; north by the lake of Zürich; west by Zug, from which it is separated by the ridge of Morgarten and by the Rossberg; south-west by Luzern, the group of the Rigi lying on the borders of the two cantons; south partly by the Waldstätten lake, which separates it from Unterwalden, and partly by the canton of Uri, an offset of the Alps called the Rosstock, from 6000 to 7000 feet high, forming the boundary. The area of the canton of Schwyz, according to Meyer of Knonau, is 360 square miles; but according to Guinaud (*Description de la Suisse*, 1839) only 279 square miles. The population, which was about 30,000 at the beginning of the present century, is now 40,650. It is the thickest peopled and most fertile of the mountain cantons, with the exception of Appenzell. None of the mountains of Schwyz being covered with perpetual snow, the cold is not so severe as in the other Alpine valleys, and the cattle are able to feed in summer as far as the summits. The horned cattle amount to 15,000 head in winter, and about 20,000 in summer; the number of sheep is about 6000; and there are also large herds of pigs, mostly in the March, and of goats. In the district of Einsiedeln the breeding of horses is attended to, and the monastery has a stud for the purpose. A considerable quantity of cheese and butter is made. Corn is only partially cultivated; potatoes are a common article of food. Flax and hemp are produced in several districts. Artificial grass is sown in some places. There are vineyards near the borders of the lake of Zürich, but cider is the common drink of the people. Kirschwasser is distilled, though not in a great quantity. The forests form a considerable source of wealth. The canton exports butter, cheese, timber, and wood for fuel, cattle to the amount of about 1,200,000 francs yearly (the greater part of which goes to Italy), horses, sheep, and pigs. It imports corn, wine, brandy, salt, coffee (which is become an article of general use), sugar, and manufactures of various sorts. The manufactures of the canton consist chiefly of linens, potash, soap, walnut-oil, wax candles, tobacco, and gunpowder. There are also some breweries, and many saw-mills, and lime and brick kilns.

The people of Schwyz are remarkable for their square athletic forms and muscular strength; the complexion is generally fair; the females, though they cannot be called generally handsome, look healthy; many persons attain a very great age. The peasantry live chiefly on bread, potatoes, milk, and coffee; they eat meat only on holidays. Most of the houses are built of wood and covered with tiles, and are warmed by stoves. The canton contains six towns, twenty-six villages forming parishes, and fifty-eight hamlets. The whole number of houses is about 5000.

There are elementary schools in the various communes, but they are under no uniform system, and there is no compulsory attendance of the children. The schoolmasters are miserably paid, and are obliged to follow other occupations. There is a college or gymnasium in the town of Schwyz, under the direction of the Jesuits, and a clerical seminary at Einsiedeln. There is also at Einsiedeln a deaf and dumb school.

Notwithstanding the little encouragement given to education, the canton of Schwyz has produced several learned men, such as the historians Ulrich Wagner and Albert von Bonstetten, in the fifteenth and sixteenth centuries; Paracelsus, who died in 1541; the naturalist Külin; Thomas Fassbind, who died in 1824, and wrote a history of the canton; the poet Zay, who has written a description of the catastrophe of Goldau; the painters Af der Mauer, Ab Iberg, Ospenthaler, Steiner, and Triner; F. Schmid, a painter of panoramas; the sculptors Hedlinger and Bodenmüller; and Baumann, who makes topographic maps in relief, after the manner of General Pfyffer of Luzern.

The language of the people of Schwyz is a Swiss-German dialect, which differs little from that of Zürich; it is full of guttural sounds, and the people accentuate the words strongly. The population of Schwyz, as well as of the neighbouring mountain cantons, is probably formed from an admixture of Teutonic or German colonists with the original Helvetians, who escaped in these remote parts both from the Roman conquests and the irruptions of the Alemanni who ravaged Northern Switzerland at the fall of the Western Empire.

Schwyz, the capital of the canton, is situated at the junction of the valley of Muota with two other valleys, one of which runs southwards to Brunnen on the shore of the Waldstätten Lake, and the other westward towards the little lake of Lowerz. Schwyz is not quite three miles distant from the Waldstätten Lake. The curiously shaped mountain called Mythen, nearly 6000 feet high, rises immediately north-east of the town, and seems to threaten to overwhelm it by its fall. The country around Schwyz is beautiful and very fertile, and the scenery is splendid. Schwyz is an open town: it has two good streets, a large square, a very handsome church, dedicated to St. Martin, which is one of the finest in Switzerland, two or three convents, a college kept by the Jesuits, a town-house, a repository of the archives, an hospital, which serves also as a prison, a library belonging to the town, which is rich in works relative to the history of the country, a cabinet of medals belonging to the family of Hedlinger, several good inns, and about 4000 inhabitants. In the burying-ground annexed to the parish church is the monument of Aloys Reding, who fought bravely for the independence of his country against the French in 1798-99. Zchokke, a contemporary writer, has given an affecting narrative of that memorable struggle in his 'Geschichte vom Kampf und Untergang der Schweizerischen Berg und Wald Kantone.' The family of Reding, one of the principal of Schwyz, has an historical reputation, several of its members having distinguished themselves at various times either in the wars of Switzerland or in foreign service. The parish church contains the rich banner given by Pope Julius II. to the Swiss troops which he had taken into his pay in the war of the Holy League. An old MS. chronicle of Schwyz mentions that colonies from Denmark and East Friesland came at a remote epoch, the date of which however is not ascertained, to settle near the shores of the Waldstätten See. One of these colonies, the legend says, was led by two brothers called Tschey and Schwyter, who quarrelled about some arrangements concerning their new settlement, when Schwyter, having killed his brother, remained sole leader, and gave his name to the country. Traditions of a Danish or Scandinavian origin are also retained by the mountaineers of the Ober Hasli in the Bernese Alps. The town of Einsiedeln, situated about 10 miles north of Schwyz, is a thriving place, with a good paved street, numerous shops, inns, and public-houses, and about 2500 inhabitants. The prosperity of Einsiedeln is owing to its celebrated sanctuary in the church of the abbey, which attracts a number of pilgrims every year. The Benedictine abbey of Einsiedeln was founded in the tenth century, and is very rich both in land and other capital. The abbot is, for spiritual matters, under the immediate jurisdiction of the pope. The monastery, which is outside of the town, is a square building three stories high, and 476 feet long and 414 wide, with spacious gardens and numerous offices and outhouses. The church has several fine altars, besides the chapel or sanctuary, which contains the image of the Virgin which is the object of the pilgrimage. The treasures belonging to it were plundered by the French in 1798, but have been since replaced in part. The library of the monastery contains 26,000 volumes. It is calculated that no less than 150,000 pilgrims repair to Einsiedeln every year.

Gersau, a small town on the shore of the Waldstätten See, was formerly a distinct republic, the smallest in Europe, with a population of about 1300 inhabitants, but it is now united to the canton of Schwyz. The people are industrious and thriving: they have manufactories of silks, leather, and potash, and they carry on a considerable trade with other parts of Switzerland and with foreign countries.

Lachen, the head town of the district of the March, on the south shore of the lake of Zürich, 16 miles north-east of Schwyz, has a handsome church, a town-house, some iron-forges, several mills, and about 1500 inhabitants. Arth, a pretty little town at the south extremity of the lake of Zug, has a good parish church, a library in the Capuchin convent, and about 1300 inhabitants.

The canton of Schwyz is divided into seven districts:—1, Schwyz Proper, which is by far the largest, and contains nearly one-half of the whole population of the canton. 2, Einsiedeln. 3, Gersau. 4, The March. 5, Küssnacht. 6, Wolrau. 7, Pfäffikon. Formerly the district of Schwyz Proper, or 'alte landschaft,' was sovereign of the rest, the other districts having no voice in the landsgemeinde, or legislative assembly of the canton, although they had their own respective assemblies and councils and magistrates, subordinate however to the cantonal authorities of old Schwyz. In 1833 a new constitution was framed upon the basis of political equality. All the citizens of the canton who have completed their eighteenth year, and who are neither bankrupts nor under a sentence of degradation, are members of the landsgemeinde, or general assembly, which meets every other year, in the month of May, in the valley of Rothenthurm, or oftener if required. The landsgemeinde appoints the landamman, or president of the canton, the statthalter or lieutenant, and the treasurer; it sanctions or rejects the projects of law or bills which are laid before it by the great council, as well as treaties with other states, gives instructions to the deputies sent by the canton to the federal diet, and it examines the financial accounts or cantonal budget. The votes are taken by show of hands, and a simple majority decides.

The great council consists of 108 members, who are elected by the various districts in proportion to their respective population for the term of six years. It publishes the laws which have passed the landsgemeinde, prepares the projects of law to be laid before the latter, it names the two deputies to the federal diet, the members of the executive commission, which constitutes the administration of the country, and who are appointed for four years, and the various officers of the cantonal administration; it votes the annual budget of the canton, audits the accounts of the revenue and expenditure, and issues ordinances for the maintenance of good order and security of the country.

The cantonal council or executive consists of 36 members, including those of the executive commission. It meets four times a year under the presidence of the landamman.

The cantonal tribunal, or supreme court of justice, consists of 14 members, besides supplementary ones, named by the various districts for the term of six years. In criminal trials of capital cases, fourteen more members are added to the ordinary ones, being chosen by the great council from among its own members. In every district there are district councils, with their respective landamman, statthalter, treasurer, and other officers for the district, besides district tribunals.

The yearly revenues of the canton amount to between 25,000 and 30,000 florins (the florin is worth about 1*s.* 10*d.* English), two-thirds of which are derived from the sale of salt, which is a government monopoly. The only regular force consists of fifteen gendarmes, but every citizen from 19 to 50 years of age belongs to the militia. The canton is bound to furnish 600 men to the federal army when required, and as many as a reserve. Every commune has a society of riflemen, and meetings for firing at the target. There is also a Society of Public Utility and a Musical Society.

In the canton of Schwyz, as well as in the other small democracies of Switzerland, the number of persons who form part of the administration is disproportionately great; there is a multiplicity of councils and authorities of every sort, and yet it is complained that business does not proceed the better or quicker for this profusion of offices. It ought to be observed however that the public officers either receive very small salaries or are altogether unpaid.

The courts of justice are said to be not sufficiently independent and impartial. The older and wealthier families and the clergy exercise considerable influence. The population is zealously Roman Catholic, exclusive and intolerant. Popular education is neglected. There is no administrative system for the relief of the destitute, who are in considerable numbers; but a communal fund in some places, and private charity in others, supply their wants. The roads are in an indifferent state of repair. In 1835 there was not a single insurance-office in the canton, although the danger from fire is very great, owing to the houses being chiefly of wood; but there were three savings'-banks, one at Schwyz and two at Einsiedeln. There was no house of correction in the whole canton, and culprits are said to have been sometimes condemned to death as the shortest way of getting rid of them. Others were banished from the canton for life. There was no code, properly speaking, but a collection of decrees of the landsgemeinde and of the great council during the last four centuries, which is called the landbuch. Whipping and irons were still in use in 1835, in order to extort confession from the accused. (Lerersche, *Dictionnaire Géographique de la Suisse.*)

The men of Schwyz are generally frank, cheerful, good-natured, and loyal, fondly attached to their country, and extremely jealous of their cantonal independence. Among the Swiss cantons, Schwyz is one of those which has shown the least federal spirit or federal sympathies. 'The democratic feeling of the people of Schwyz, as well as of the other forest cantons, is of a different nature from that of the democratic party in the towns or larger cantons; the latter being active, restless, meddling, and inclined to enlarge the sphere of its influence, whilst the democracy of the forest cantons is stationary and self-satisfied, and though intolerant and uninformed, yet unencroaching and unobtrusive, but at the same time extremely jealous of all intrusion from abroad. . . . . The great dread of these small cantons is that of losing their separate existence as independent and sovereign states, and being merged into one huge republic with the rest of Switzerland, a project long entertained by the democrats of the French school in the larger cantons. The people of the forest cantons abhor the very idea of centralization, which, however accompanied by republican forms, they consider as tantamount to servitude. At the time of the French invasion in 1798, they stubbornly refused to be incorporated with the rest of Switzerland into a republic one and indivisible: the men of Schwyz, led by Aloys Reding, resisted and repelled the invaders for a time; and their countrymen of Unterwalden allowed themselves to be slaughtered rather than submit to the overbearing dictate. Still more recently, when the town cantons proclaimed, in 1830-31, the principle of equal political rights, the people of the forest cantons suspected that there was some analogy betwen that and the revolutionary spirit of 1798; and that the system of centralization and unity of administration, which they detest, was at the bottom of the movement. If this was liberty, it was not their liberty. They therefore kept aloof, and showed a stern front of opposition to all attempts at innovation in the federal pact. They exhibited the remarkable phenomenon, worthy of the attention of those who look beyond names and outward forms in social institutions, of the oldest and freest democracies of Europe ranging themselves on the same side with the partisans of the old aristocracy of the towns against the impulse of modern democracy, which with its organised masses and military-like discipline hurries on all questions towards an abrupt solution by numerical majority and physical force.' (*History of Switzerland*, by A. Vieusseux, published by the 'Society for the Diffusion of Useful Knowledge,' p. 277.)

The above sketch of the social and political state of Schwyz applies in great measure to the other mountain cantons of Switzerland, but more especially to the three Waldstätten, or forest cantons, Schwyz, Uri, and Unterwalden.

SCIATICA is a name often applied to all rheumatic affections about the hip-joint and the back of the thigh, but which is more properly adapted to a disease of the sciatic nerve, either inflammatory, or similar in its nature to those which in other parts are designated Neuralgia, or Tic douloureux. The pain in sciatica commonly follows, or is situated in some part of, the course of the sciatic nerve, extending from the inner portion of the buttock along the back of the thigh to the ham, and sometimes continued to the foot along the track of the nerves of the leg. It occurs especially in adults and in old persons, and more particularly in those that have been subject to rheumatism; the pain is generally remittent, and seldom ceases altogether; but is commonly aggravated in the evening. For the treatment and other circumstances connected with sciatica, we must refer to the articles NEURALGIA and RHEUMATISM.

SCIENCE. The word *scientia*, in real Latin, simply means knowledge, and we must attribute the subsequent application of the word to particular kinds of knowledge to causes similar to those which have influenced the use of the equally general term MATHEMATICS [vol. xv., p. 11 It does not appear that in the earlier parts of the middle ages *science* had any distinct meaning as opposed either to *literature* or to *art*. Almost at the earliest establishment of universities, the great preliminary branches of knowledge were separated from the rest under the name of *liberal arts:* that is to say, the Trivium, containing grammar, logic, and rhetoric; and the Quadrivium, containing arithmetic, geometry, astronomy, and music. If theology, law, and medicine were called sciences, it was not in any distinctive sense, and we are inclined to think that *science* must then have been rather a term subaltern to art, than opposed to it. We find Roger Bacon (*Op. Maj.*, cap. xv speaking of the nine mathematical sciences, and the six great natural sciences, which contain under them many other sciences: and his contemporary Robert of Lincoln (*Tract. de Art. Lib.*), after laying it down that the arts (or sciences), of which it is the office 'operationes humanas corrigendo ad perfectionem ducere,' are seven in number, proceeds to describe them without a single use of the word science. How the word grew it is not our business to inquire closely; but by the middle of the sixteenth century the word *science* had begun to appear as denoting connected and demonstrated knowledge, in opposition to *art*, which signified digested rules of operation not connected with each other by deduction from common first principles. Thus Tartalea, a writer on algebra (which was then, and most properly, called only an *art;* ars magna, or arte maggiore), styles Euclid, in the preface to his edition of the Elements, 'the sole guide to the mathematical *sciences*.' By the middle of the seventeenth century, the term science was freely used in the sense which it has never since lost, namely, that in which it is opposed to literature. But the old distinction of science as opposed to art has still remained, though the two terms, in this sense, have been in great measure superseded by theory and practice; but improperly, for the distinction between science and art is one thing, and that between theory and practice another. [THEORY.]

A science, as distinguished from an art, is a body of truths, the common principles of which are supposed to be known and separated, so that the individual truths, even though some or all may be clear in themselves, have a guarantee that they could have been discovered and known, either with certainty or with such probability as the subject admits of, by other means than their own evidence. It is not necessary that these truths should have been discovered by a scientific process; it is enough that they admit of such treatment subsequently. The telescope, for instance, may have been discovered accidently; but it can now be demonstrated beforehand that such an instrument must produce the effect which it is known to produce, and the rules for its construction may be deduced from the simple fundamental properties of light. In the sense of the word above used, the number of perfect sciences is not so great as is commonly supposed; for many branches of knowledge which bear the name are not perfect sciences, such as medicine, zoology, and geology;—in all of these, large classifications have been made, many principles have been deduced which seem to be of universal application, and much has been done to make these known principles point out the direction of inquiry; but it would be idle to say that either of them is a science in the sense in which astronomy is a science.

Science, as opposed to literature, means any branch of knowledge in which the affections of mind or matter are to be made the subject of reasoning, with a view to discover and apply first principles. The distinctions of mental and physical sciences, the subdivision of the former into ethical and psychological, &c., whatever terms may be employed, are real and useful. But as it is not the object here to classify human knowledge, but only to give a slight account of the mode of using a word, we may pass on to its common signification.

By science, in popular language, is meant simply mathematical, physical, or natural science, not with reference to principles, but to results. Calculation, collection of natural objects, construction of models, use of philosophical instruments, any or either, is science, or part of science; and a man of science (man of *a* science, or man of the art which is built upon *a* science, would frequently be a correct description) may be either a mathematician, mechanist, engineer, medical practitioner, astronomer, geologist, electrician, zoologist, ornithologist, &c. To this sort of designation there can be no objection in itself, and it is convenient as distinguishing followers of science, or of a science, from those of literature. But it is not sufficiently precise in itself to distinguish the followers of different sciences from one another. When a literary man is named, his pursuit is generally indicated: the historian, the antiquary, the poet, the novelist, the politician, the scholar, and the linguist, are not confounded by means of a general term: insomuch that 'literary man,' by itself, generally implies one of information, but not of distinguished depth in any one particular branch. But the inquirer into the sciences of electricity and magnetism, for example, has no name to distinguish him from the observer and classifier of insects; that is to say, the proper technical names are not familiar to the world at large. But this is the least inconvenience. When the word science comes to be used in its high and proper sense, indicative of truth discovered, error prevented, inquiry organised, judicious habits formed, and mental energy strengthened, it must be difficult for those who are used to the common sense of the word to imagine the truth of many things which are said about it. 'All we require is, that he will hold his former opinions and judgments without bigotry, retain till he shall see reason to question them, be ready to resign them when fairly proved untenable, and to doubt them when the weight of probability is shown to lie against them. If he refuse this, he is *incapable of science*.' Now this, though the word of a good authority, and perfectly true, is nevertheless notoriously false in the common sense of the word science: a man may be incapable of the preceding state of mind, and may be a man of science. There is no remedy for this confusion of terms, except that which every one must make for himself, by attention to the different senses of the word, the higher and the lower.

SCILLA. (Botany.) [SQUILLA.]

SCILLA, or as Steinheil, who separates it and another species (S. Pancration) from the old genus, terms it, Squilla Maritima, or Sea-onion, is a plant common on the sandy shores of the Mediterranean, Portugal, and the Levant. It is imported into Britain from Malta and other parts of the Mediterranean, and also from Petersburg and Copenhagen. The officinal part is the bulb, of which there are two varieties: the one large and whitish externally; the other smaller, of a brownish-red colour. The former is preferred in England, the latter in Germany. The bulb part partakes in its outer part of the nature of a *tunicated*, in its inner, of the nature of a *scaly* bulb. It abounds in an acrid, mucilaginous juice, with an alliaceous odour, and a bitter, acrid, nauseous taste. It is imported whole, or cut in slices and dried. The bulb is not of equal potency in every part. The outer, dry, scarious integuments are devoid of activity; the subsequent fleshy scales are the most powerful; while the internal young ones are mucilaginous, nearly insipid, and powerless. It is clear from this that the best mode of drying squill is to decorticate it by removing the outer segments, and carefully separating the intermediate large fleshy scales, to dry these quickly, and to leave the central ones as inefficient. The drying should be conducted quickly, but not by too high a temperature, lest some of the active principles be driven off. Putting the thick scales on sieves or willow-baskets in a moderately heated oven, or in a room fitted with a drying apparatus, is the best plan. Stringing them on threads and drying them slowly, by which they become paper-like and tasteless, is bad. The common method however is to cut the bulb into transverse slices, which, when dried, have a horny appearance, and are semi-translucent. In this case the active and inactive portions are blended together. After whatever means are used to dry them, it is necessary that the squills be kept in well stoppered bottles in a dry place, as, in common with all bulbous plants, they quickly absorb moisture from the atmosphere. In the process of drying, four-fifths of the weight are lost.

The chief constituents of squill are—an acrid bitter principle (*Scillitin*), sugar, mucilage, salts of citrate or tartrate of lime, also phosphate of lime, and a volatile acrid principle, which in the process of decorticating fresh squill causes a flow of tears from the eyes, sneezing, &c., and severe itching, with burning pains of the hands and arms, yet without obvious swelling or inflammation. A scale of fresh squill applied to the skin rapidly excites rubefaction and vesication, like a sinapism. Squill in large dose is unquestionably poisonous, but in many cases it fortunately acts as its own antidote, by causing vomiting. But even in moderate doses it may still do much harm, by its stimulating effect, if prematurely employed, as it often is, as a popular or domestic medicine in the early stages of colds and coughs. It is for the second stage alone of these that it is suited. It augments the secretion from most mucous surfaces, and also stimulates the kidneys, and sometimes the skin. For the reason above stated, it is unsuited to inflammatory dropsies, but it is proper for the effusions occurring in leucophlegmatic subjects, depending on debility, and for general anasarca rather than local effusions. Its diuretic properties are increased by the previous moderate use of mild mercurials, and by uniting it with other diuretics, either vegetable or saline, and still more by adding bisulphate of quinia or other tonics. Its expectorant properties are greatly heightened by the addition of tonics, such as exist in the Mistura Cascarillæ Composita. Squill is a very improper emetic for young children, as it seriously irritates the coat of the stomach.

SCILLA. [CALABRIA.]

SCILLY ISLANDS, a remarkable group of islands lying off the Land's End in Cornwall; they are comprehended between 49° 51′ and 50° N. lat., and between 6° 11 and 6° 30′ W. long. The lighthouse on St. Agnes, one of the southernmost of the group, is, according to the Ordnance Survey, in 49° 53′ 38″ N. lat. and 6° 19′ 23″ W. long.

The antient condition of this group of islands has been the subject of much discussion. There is a local tradition that the extremity of Cornwall once extended farther towards the west than it does at present, and that a tract of land called, according to Camden, 'Lionesse,' was overflowed or washed away by the sea. This district, which is said to have contained 140 parish churches, is thought to have connected the Scilly Islands with the mainland of Cornwall. If the tradition and the supposition built upon it have any foundation, the event must have occurred long before the introduction of Christianity and the erection of 'churches;' for Strabo speaks of the number of islands as amounting in his time to ten. That these islands may at some remote period, antecedent to authentic history, have been united to the main, and have been separated from it by the encroachment of the sea, is not improbable, from the general violence of the sea, and the changes which it has wrought and is still working among the islands. It is observable too, that while the Scilly Islands are for the most part composed of granite, an insulated rock called the 'Wolf,' between the islands and the main, is composed of limestone, a rock of more yielding character. Notwithstanding their greater hardness, the islands themselves 'are undoubtedly undergoing a gradual diminution. At no great distance of time St. Mary's will probably be divided by the sea.' (*A Guide to Mount's Bay and the Land's End*, by a Physician (Dr. Paris), London, 1824).

At present there are more than 140 islands, but a large part of them are uninhabited. Thirty-eight are enumerated, and their estimated area and population given by the Rev. Geo. Woodley (*A View of the Present State of the Scilly Islands*, London, 1822). We add their relative position:—

Islands.		Area in Acres.	Population. 1821 (Woodley).	Population. 1831 (Pop. Returns).
St. Mary's	E.	1640	about 1400	1311
Tresco	N.W.	880	480	470
St. Martin's	N.E.	720	280	230
St. Agnes	S.	390	282	289
Bryher	N.W.	330	140	128
Samson	W.	120	34	37
		4080	2616	2465
Or, as given in the Population Returns .		5770		

Islands.		Acres.	Islands.		Acres.
St. Helen's	N.	80	Guahall or Gweall	N.W.	10
Teän	N.	70	Northwithel	N.	9
White Island, near St. Martin's	N.	50	Toll's Island	E.	7
Annet	S.W.	50	White Island, near St. Samson's	W.	7
Great Arthur	N.E.	30	Little Arthur	N.E.	7
Great Ganilly	N.E.	20	Pednathise	S.W.	7
Great Gannick	N.E.	18	Inaswiggick	W.	8
Crebawithen	S.W.	22	Little Ganilly	N.E.	6
Melledgan	S.W.	20	Little Gannick	N.E.	5
Gorregan	S.W.	20	Ragged Island	N.E.	5
Rosevean	S.W.	16	Innisvouls	N.E.	4
Minewithen	N.E.	15	Round Island	N.	3
Norenour	N.E.	13	Maiden Bower	N.W.	3
Mincarlo	W.	12	Penbrose		2
Rosevear	S.W.	12	Great Crebinack		2
Camperdeney	S.W.	10	Scilly	N.W.	1

The islands form a compact group, surrounded by a deep sea, from which they rise for the most part abruptly, with rugged sides. In the channels which separate the islands the depth of the sea is much less; and in several parts extensive flats, some of them dry at low water, and others covered with water only knee deep, extend from island to island. The islands and rocks consist almost entirely of granite, but there are some beds of porphyry and some of chlorite containing pyrites in St. Mary's. Detached stones of gypsum and alabaster are found in Tresco, St. Martin's, and St. Mary's. The granite is, according to Dr. Paris, a continuation of the Devonian range, though it presents a less porphyritic appearance. It is very liable to decomposition, and presents some interesting geological phenomena. The shores are covered in some parts by a coarse sand, the detritus of granite, occasionally agglutinated into a kind of sandstone; in other parts by a fine shining white sand. 'The climate of these islands is milder and more equable than that of Cornwall, but this advantage is counterbalanced by the frequent occurrence of the most sudden and violent storms. By those who have kept journals, it has been found that not more than six days of perfect calm occur in the course of the year, and that the wind blows from between south-west and north-west for more than half that period.' (Dr. Paris.)

St. Mary's, the most important island, consists of two portions, the smaller of which, called 'the Hugh,' is united to the other part by a low sandy isthmus, on which stands 'Hugh town,' the principal place in the island. The shore is generally steep, and there are some small inlets or coves besides St. Mary's pool, on the north side, and Porth Cressa on the south side of the isthmus of Hugh Town. The whole island is about 2½ miles long, 1¼ mile broad, and about 8 miles in circumference. The soil is generally good; about one-half of it is in cultivation, and produces luxuriant crops of corn and potatoes. Hugh Town consists of one principal street, very crooked, and of several lanes, alleys, and courts: the houses, which are chiefly built of stone procured in the neighbourhood, are small and irregular; the better sort are covered with tiles or slates, the poorer with thatch. There are several shops, and a number of inns: and most kinds of handicraft are exercised in the island. There is a pier 420 feet long and 20 broad, extending into St. Mary's pool. A small building, sometimes called 'the court-house,' is occasionally used by the council appointed by the proprietor of the islands; beneath it are a small prison, and a butcher's stall dignified by the designation of 'market house.' The other principal buildings are the steward's house and the post-office. About a mile from Hugh Town, eastward, is a hamlet or village called Old Town, once the principal place in the island, and still containing about 200 inhabitants, chiefly fishermen: and small cottages are dispersed over the island, occasionally grouped three or four together: one small group is called London, and another Bristol. The church, a miserable cruciform building of stone, without a tower, is near Old Town. The Hugh is a steep hill rising about 110 feet above the level of the sea, fortified by lines having a circuit of more than a mile, with eighteen bastions or batteries, and enclosing a small fort called 'Star Castle,' and barracks for the officers and troops. The works are not complete; above a hundred guns might be mounted upon them, and many more if they were completed. Some Druidical and other antiquities are found scattered over the island; and there are some remains of batteries or fortifications. A clergyman of the establishment resides at St. Mary's, and is supported by the Society for the Promotion of Christian Knowledge: he keeps the registers of the different islands. There were in 1833 six day-schools: two of them, with 60 children of both sexes, supported by the Society for the Promotion of Christian Knowledge; the four others, one of them having a small endowment, contained 152 children. There were two Sunday-schools, with 195 children, supported by the Wesleyan Methodists and Baptists, the former of whom have a meeting-house in Hugh Town, and the latter some preaching stations in the island.

Tresco or Trescow, the island next in importance, is inhabited chiefly by pilots and fishermen. Most of the houses are on the north-east side, near the beach, opposite a harbour called Old Grinsey harbour; and form a village called Dolphin Town, perhaps an abbreviation of Godolphin Town, from the Godolphin family, long the lessees of the islands. In the south part of the island, by the side of a fine sheet of fresh water, half a mile long and a furlong broad, are the remains of a religious house or abbey. Tresco has a small fort or blockhouse not garrisoned, a mission-house of the Society for the Promotion of Christian Knowledge, a small church, and a Wesleyan meeting-house. A stone tower called Oliver Cromwell's castle, [illegible] deserted, commands the harbour of New Grinsey on the west side of the island, and near it are the ruins of a fortress called King Charles's castle. There is a Druidical circle, and on the north side of the island is a remarkable subterranean passage called Piper's Hole. A clergyman is placed here by the Society for the Promotion of Christian Knowledge, by which a day-school (having, in 1833, 60 children) is maintained. There were in 1833 two dame-schools, with 23 children.

St. Martin's, nearly 2 miles long from east-south-east to west-north-west, and about 6 miles in circumference, is chiefly inhabited by pilots and fishermen. The houses form three groups: Higher Town, on a hill rising from a bay on the south shore; Middle Town, in the centre of the island; and Lower Town, near the south-west point of the island. Higher Town consists of nearly fifty small houses built of stone and thatched, with a small church much improved of late years. About the middle of the seventeenth century, the island was uninhabited; but there are indications that at an earlier period it was fully peopled. The cause of its depopulation is not known. The soil is chiefly waste land, or used as common pasturage; when cultivated it affords good pasture, and plentiful crops of corn and potatoes. Large flats or sands, dry at ebb tide, or covered with very shallow water, extend from St. Martin's to Tresco; but the passage is dangerous from the looseness of the sand. On St. Martin's Head, at the eastern end of the island, is a tower twenty feet high, with a conical top, built on an earthen mound, and designed as a landmark for seamen. A day school, maintained by the Society for the Promotion of Christian Knowledge, had, in 1833, 51 scholars; and there were, at the same time, one infant-school, maintained by the Society of Friends, with 12 girls, and one Sunday-school, with 67 children.

St. Agnes has a very irregular outline; it is surrounded by rocks, and the shore is rocky and almost inaccessible, yet the soil is the best cultivated and most productive in the whole group. It consists of two parts, St. Agnes proper and the Gugh, separated from each other at high water, but connected, when the tide is out, by a narrow neck or isthmus of sand. St. Agnes proper is a mile in length, with an average breadth of half a mile, and four miles and a half in circumference; the Gugh is three-quarters of a mile long by one-quarter broad: it is stony and uncultivated, and affords only scanty pasturage to a few straggling sheep. The houses in St. Agnes are not grouped in villages, but scattered about according to the taste and convenience of the inhabitants; they are of stone, covered with thatch. There are a small church and a lighthouse, which latter stands on the highest point of the island, about 50 feet above the level of the sea: it is a substantial stone tower of a circular form, 100 feet in circumference at the base, and tapering towards the summit, which is 52 feet high, surrounded by a lantern of 20 feet additional height, with a revolving light.

Bryher extends about a mile and a half from north to south, with an average breadth of scarcely half a mile; it consists of several steep hills connected by tracts of low land, a considerable part of which is in cultivation. On the east side of the island, between it and Tresco, is New Grinsey harbour, formed by the shores of the two islands and by the flats, fordable at low water, which in one part connect them. Some of the houses are grouped in what is called 'the town of Bryher;' and there is a church, erected a few years since in place of a more antient one.

Samson lies south of Bryher, with which, as well as with Tresco, it is united by flats fordable at low water. But little land is cultivated or capable of cultivation: the few inhabitants support themselves by fishing, making kelp, and occasionally acting as pilots. The island affords no good water; and the encroachment of the sand has ruined what was formerly meadow-land. Both Bryher and Samson have some antient barrows.

The natural produce of the Scilly Islands consists of a thin short grass intermixed with chamomile, heath, and dwarf furze: fern and moss are found near the shore. The soil is commonly a black peat, mingled with granitic particles; though sandy, it bears in many places good crops of potatoes and barley; and considerable quantities of potatoes are sent to Gibraltar and the West Indies. Wheat and rye are also grown. The cultivated land might easily be extended. Fallows are not used, and the land is impoverished by the insufficiency of manure, for which sea-weed is commonly employed. The implements of agriculture are similar to those used in Cornwall, but of inferior construction. There are no timber-trees, and no fruit-trees, except in a few sheltered spots in St. Mary's. Garlic is much cultivated, and most kinds of vegetables and flowers which grow in England succeed here. Cattle and horses are small and poor: their food consists partly of sea-weed for cattle, and furze for horses: many in the course of the winter die of hunger. The sheep are of a peculiar breed and small size; hogs are numerous; poultry scarce and poor; and rabbits not so numerous as formerly. Wild birds, especially sea-birds, are numerous; but the puffin, once very plentiful, is now seldom seen. Fish are less numerous in the surrounding sea than formerly; several small sharks have been observed in the summer months of late years; porpoises are frequently seen.

The Scilly Islands belong to the duchy of Cornwall, and were long held on lease by the lords Godolphin, and since by the duke of Leeds, whose lease expired within the last ten or twelve years. The lessee has usually appointed a council of twelve to exercise a civil jurisdiction, but persons charged with capital offences are taken to Penzance to the justices of the county of Cornwall. A military commandant at St. Mary's and a collector of the customs are appointed by the authorities in London. We are not aware what changes have been introduced, if any, since the expiration of the lease. The islands are considered to be in the diocese of Exeter, but there has been no visitation either by bishop or archdeacon, unless it be quite of late years; neither has the rite of confirmation been at any time administered. Two clergymen, employed by the Society for the Promotion of Christian Knowledge, are employed here; they reside at St. Mary's and Tresco respectively: when they cannot visit the churches on the other islands, the service is performed by the clerks. The Society also supports schools on the principal islands; and distributes Bibles, Prayer-books, and other religious books. The yearly expense of the missions and schools is from 400*l.* to 500*l.* The tithes of the islands belong to the duchy of Cornwall.

The islanders are generally able to read and write: their pronunciation, though not unmarked by provincialism, is more correct than, from their remote situation, would be expected. They are a contented race; attentive to their religious duties, and generally correct in their moral conduct, especially in the smaller islands; and distinguished by personal independence of character. The charge of indolence, sometimes brought against them, is considered by Mr. Woodley as unfounded. Their general condition is poor; their employments are agriculture, fishing, making kelp, and pilotage. Woodley (A.D. 1822) estimated that the number of small vessels (most of them held in shares by from three to eight persons) employed in fishing and pilotage was about one hundred. In these pursuits many of the islanders perish.

The Scilly Islands are generally considered to have been the Καττιτερίδες or Κασσιτερίδες (Cassiterides) of the Greeks. [CASSITERIDES.] Diodorus Siculus distinguishes between the Cassiterides and Britain, and speaks of tin as brought from both. Strabo also distinguishes between the Cassiterides and Britain. But it seems probable that the western extremity of Cornwall must be included in the term Cassiterides, and that the chief supply of the metal was derived from it, for there are no traces of workings in the islands sufficient to countenance the opinion that much tin was ever obtained from them. The inaccuracy of the antient writers may perhaps be accounted for by the two different channels by which the Cornish tin-trade was carried on. One part of the metal was sent by sea to Spain; this was probably the most antient course of the trade opened by the Phœnicians and their colonists in Spain and Africa. The merchants who carried it on knew of no other part of Britain than the western, to which they gave, with the Scilly Islands, the general designation of Cassiterides; hence Strabo and Diodorus both describe these islands by their position relative to Spain, instead of their situation with regard to the much nearer island of Britain, of the proximity and indeed identity of which with the Cassiterides they appear to have had no idea. Another part of the metal was conveyed overland by the Britons themselves, and from thence, as Diodorus relates, to the opposite shore of Gaul, and, on horses, overland, through Gaul to Massilia and Narbo: this tin, though from the same district as the other, was reputed to come from a different quarter, viz. from Britain. If, as we are disposed to think, the island Ἴκτις (Ictis) of Diodorus, which was the emporium of the Gallic tin-trade, and beyond which the merchants from Gaul do not seem to have gone, was the same as the Οὐηκτις (Vectis) of Ptolemy (the modern Isle of Wight), the remoteness of this from the tin country, to which the merchants from Spain went, will account for the two classes of traders not having fallen in with each other, and for their not having ascertained that their supposed different sources of supply were really one and the same.

Mr. Woodley supposes these islands to be the Oestrymnides of Festus Avienus (*Ora Maritima*, 94, et seq.), and he is probably correct in this supposition. Also Dionysius Perigetes speaks of them under the name of the Hesperides, 'the parent of tin' (l. 563). Mr. Woodley's attempt to trace the antient history of these islands is a mass of confusion and inaccuracy.

The conquest of South Britain by the Romans must have led to the discovery of the proximity of the Cassiterides to Britain, if not of their identity with it. But neither Ptolemy nor Pliny the Elder appears to have examined into the matter; for both (Ptol., lib. ii., c. 5; Plin., *Hist. Nat.*, lib. iv., c. 36) describe the Cassiterides as being opposite to Spain, and do not notice them in their account of Britain. We gather from Pliny that the maritime or Hispano-Phœnician tin-trade had ceased; for he speaks of the account of that metal being sought in certain islands of the Atlantic, and brought in wicker boats covered with leather, as a mere fable. (*Hist. Nat.*, xxxiv. 47.) Indeed he gives no intimation of any tin being found in Britain, though he speaks of the lead that was obtained there. It is not unlikely that the confusion caused by the Roman conquests in Gaul, Spain, and Britain, had for the time at least put an end both to the working and sale of the metal.

From the time of the Romans, who used them occasionally as a place of banishment, there is no notice of the islands in history until their conquest by Athelstan, king of England, who expelled the Danes about A.D. 938. Of their antient importance these islands retain little trace. There are some Druidical monuments; but the antient inhabitants appear to have disappeared, from what cause is unknown, and to have been replaced by others of Saxon origin, as indicated by their names, language, and customs. The Scilly Islands do not appear to have always formed part of the duchy of Cornwall; at least they are not enumerated in the original grant of that duchy to the eldest son of the king of England. (12 Edward III.) Part of the islands, and the churches in all of them, belonged to the abbey of Tavistock, but the whole group were regarded in the middle ages as of little importance; and it was not until the Spanish wars in the time of Elizabeth that they attracted much notice. In the great civil war they were long held for the king by Sir John Greenville or Granville, who fitted out armed vessels, which made several captures. At length, A.D. 1651, a formidable armament, under Admiral Blake and Sir George Ayscue, was sent, which quickly effected the reduction of the islands. Sir Clondesley Shovel was lost on the rocks which form the south-western portion of the group, with his own ship and some others, on their return from Toulon, A.D. 1707. (Troutbeck's, Borlase's, and Woodley's *Accounts of the Scilly Islands.*)

SCINCOÏDIANS, or **LEPIDOSAURS**, the names given by Oppel, Fitzinger, and MM. Duméril and Bibron to their last family of *Saurians*.

This family, observe MM. Duméril and Bibron, seems again to establish a sort of connection with or transition to the great division of Serpents, by the intervention of certain species, such as those of *Anguis* and *Acontias*. It is, they remark, a group of Lizards, whose numerous races are found spread over the most arid regions of temperate climates, as well as those where the temperature is always very high.

These *Lepidosaurs*, according to the distinguished herpetologists last above mentioned, join to the general character of the Saurians many peculiarities which distinguish them from the seven other families of that order. Thus, their cranium is covered with great plates, joined together at their edges, most frequently angular, whose sutures or lines of junction always remain distinct. Their trunk is completely covered with scales, more or less large and solid, of variable form, but always disposed like a coat of mail, placed quincuncially, and overlapping each other like tiles or slates, nearly like those of the greater part of the osseous fishes. The Scincoïdians have besides the tongue free, fleshy, not of much thickness, slightly notched at the point, and covered totally or partially with scaly papillæ. Their belly is cylindrical, without lateral folds, and covered with scales, having the same disposition, and, in general, the same form as those of the back.

All these characters suffice to distinguish the *Scincoïdians* from the whole of the other families. The great angular plates which are applied on the bones of the head and face are never seen in the *Chameleons*, the *Geckos*, the *Crocodiles*, the *Varanians*, nor in the *Iguanians*. They are, it is true, found in the *Lacertians* and in the *Chalcidians*, but the first have always the scales of the belly different from those of the upper part of the trunk, and, in the others, besides the disposition of the horny lamellæ so as to form verticillations or transverse rings, there is most frequently a fold on their sides throughout their length, from the cranium to the origin of the tail.

The form and the mode of insertion of the tongue, which in one part is free, or not attached by its circumference to the concavity of the lower jaw, serve to distinguish the Scincoïdians from the Crocodiles; on the other hand, as the tongue of the Scincoïdians cannot be withdrawn into a sort of sheath, this conformation removes them from the Chameleons, which have the tongue very long, cylindrical, and terminated by a concave and viscous tubercle. The same conformation serves to separate the Scincoïdians from the Varanians, which have this organ endowed with capability of re-entering into a sheath, at the same time that its free extremity is deeply divided into two points. Finally, the tongue of the Scincoïdians is not free, or disengaged from adhesion at its point only, as in the Geckos and the Iguanians. The lateral walls of the trunk are not hollowed with a longitudinal furrow, as in the *Chalcides*, and the skin of the belly below is not furnished with plates with four principal faces, or with quadrilateral scales more or less elongated, and larger than those of the back, as may be observed in the *True Lizards*.

MM. Duméril and Bibron thus sum up the essential characters of the reptiles which compose the family of the Scincoïdians:—

1. Head covered above by horny plates, which are delicate, angular, and opposed to each other (affrontées) by their faces (pans) in a singular manner.

2. Neck of the same form and size as the breast.

3. Trunk and limbs entirely clothed with imbricated scales, with many faces (pans), most frequently widened, and with the border slightly rounded, disposed quincuncially, back rounded, without crests or elevated spines, belly cylindrical, without any groove or lateral furrow.

4. Tongue free, flat, without a sheath, slightly notched in front, the surface covered entirely or partially with papillæ, ordinarily all in the form of scales, but occasionally some are squamiform and others filiform.

Oppel included under his *Scincoïds*, which he made the fifth family of the order Saurians, the five following genera only, the *Scinks*, the genus *Seps*, the *Scheltopusiks*, the genus *Anguis*, and the *Orvets*.

Fitzinger, in adopting the same family name, introduces a greater number of genera, viz. *Spondylurus*, *Scincus*, *Mabuya*, *Tiliqua*, *Heteropus*, *Seps*, *Zygnis*, *Scelotes*, and *Pygodactylus*.

Cuvier's Scincoidians consisted of the genera *Scincus*, *Seps*, *Bipes* (Lacép.), *Chalcis*, and *Chirotes*.

Wiegmann divides the Scincoidians into two families:—1, that of the *True Scinks*, whose eyes are protected by lids; and 2, the *Gymnophthalms*, which have no moveable or visible eyelids. He divides the genera into those which, like the Lizards, have four well-formed feet, with five toes, and which have auditory holes, at the bottom of which the *membrana tympani* may be seen. Here he arranges *Spondylurus*, a genus established by Fitzinger on the incorrect statement of Daudin, that *Sloane's Scink* had pores on the thighs, the *Scinks*, *Sphenops*, *Trachysaurus*, and *Euprepis*, and, among the *Gymnophthalms*, *Ablepharus*.

Then come the genera which, like *Seps*, have the trunk slender, rounded, and still four limbs, but very short and very distant from each other. To this division, among the Scinks, he refers the genera *Lygosoma* and *Zygnis*, whose auditory holes are visible; and among those which have them not, the genera *Podophis*, *Seps*, and *Peromeles*. In this same division, but among the Gymnophthalms, two genera only are included by Wiegmann, viz. those of the Gymnophthalms properly so called, and *Lerista* of Bell.

In the third division are placed the genera which resemble the *Orvets*, and whose body is always furnished with anterior feet, whilst the posterior feet are sometimes wanting. Among the Scinks properly so called are arranged the genera *Pygodactylus*, *Otophis*, *Scelotes*, *Anguis*, and *Acontias*; and among the Gymnophthalms, the two last genera *Pygopus* and *Typhlinus*.

Cocteau, whose premature death prevented the completion of his 'Monograph,' the first number of which was pulished in 1836, under the title (which MM. Duméril and Bibron well characterise as modest, for few zoologists understood the subject more completely) of 'Etudes sur les Scincoïdes,' and which would have embodied the experience and labours of the five or six last years of his life, presented, in 1837, to the French Academy, his great table of the classification of this extensive group. These 'Tabulæ Synopticæ Scincoideorum' formed the prodromus only of an extensive work undertaken for the classification of the species which belong to three of the tribes of the family which Cocteau named *Cyprilepids*, or those covered with scales after the manner of a carp.

These species are distributed into three sections, according to the presence or absence of feet.

The two first, which have feet, are united under the common name *Pedotes*, and are subdivided into the *Scincidoïds*, which have four feet, and the *Hysteropods*, which have only posterior feet,—in other words, into *Tetrapods* and *Dipods*. A third section would comprehend those species which are deprived of feet, if any should be discovered, under the name of *Anguinoïds*.

The *Scincoïds*, or first family, consist of three tribes: 1, the *Saurophthalms*, whose eyes, like those of the True Lizards, are furnished with moveable lids; 2, the *Ophiophthalms*, which have no eyelids, or extremely short ones, giving their eye the appearance of that of Serpents; and, 3, the *Typhlophthalms*, which have the eyes entirely hidden, a tribe established for any species which might be so organized, but which had not been discovered.

The *Saurophthalms* comprise those genera which have, 1, a distinct tympanum or an external auditory canal, as the Lizards or the *Saurotites;* 2, those which have not this part visible, as in the Serpents, would be the *Ophiotites;* but of this last section no examples had been observed.

Among the *Saurotites* are genera which have the feet or toes complete, the *Teleodactyls;* these constitute only one great genus, that of the Scinks properly so called, subdivided by the author into thirteen series or subgenera. These are founded, in the first place, on the state of the surface of the tongue, which is sometimes covered with papillæ, all lamellar or scaly, and to such he gives the name of *Lepidoglosses*, whilst he calls those which have this surface partly composed of papillæ of a mushroom shape, and partly of lamellar papillæ, *Diploglosses*. These last consist of a single genus only, *Diploglossus* of Wagler.

The *Lepidoglosses* are further subdivided, according to the form of the muzzle, which is sometimes wedge-shaped (en coin); these are termed *Sphenopsides*, and Cocteau refers to them Fitzinger's two subgenera of *Scincus*, viz. *Scincus officinalis* and the *Sphenops* of Wagler, which differ from each other in the form and inequality of the toes. The *Conopsides*, or those with a conical muzzle, sometimes have the scales of the back smooth, or without projecting lines; these are the *Ateucholepides*, and they form the most numerous division, for they comprehend seven subgenera, subdivided into, 1, *Omolepids*, or those with flat dorsal scales; 2, *Strigolepids*, with striated dorsal scales. Among the *Omolepids* some are without palatal teeth, the *Anoplophores;* and some are furnished with them, the *Oplophores*. Both the one and the other are divided according to the disposition of their lower eyelid, which sometimes offers a transparent disk, the *Hyaloblepharides*, and sometimes, as in ordinary, is covered with small scales, the *Scleroblepharides*. Such are the subgenera *Tiliqua*, *Keneux*, *Euprepes*, *Rachites*, *Psammites*, *Heremites*, and *Arnes*.

The *Conopsides* with pointed dorsal scales, are named *Silubolepids*, and these scales are sometimes carinated, as in *Tropidosaurus*, Boié (*Tropidophorus*, Dum. and Bibr.), and sometimes rugose, as in *Trachysaurus*, Gray.

The *Saurotites* with imperfect feet either entirely or with regard to the number of the toes (*Ateleodactyls*) have in fact sometimes the toes on the four feet, but differing in number before and behind; such are the two subgenera of *Heterodactyls* named *Heteropus* and *Champsodactylus;* sometimes, on the contrary, as in the *Omodactyls*, the number of toes is the same on each foot, for example, four in *Tetradactylus* (Péron), or *Peromeles* (Wagler), and three only in *Tridactylus* and *Zygnis* (Oken).

The second tribe of Ophiophthalms, or the Scincoids which have the eyelids very short and immoveable, is divided, nearly in the same manner as that of the Saurophthalms, into *Saurotites* and *Ophiotites*. The first are either *Teleodactyls* or *Ateleodactyls*. In the first subdivision there is but one genus, the *Ablepharides*, which are again subdivided into *Ablepharides* properly so called, and *Cryptoblepharides*. In the second subdivision also there is but one genus, *Gymnophthalmus* (Merrem).

The only genus referred to the second subtribe, *Ophiotites*, is *Lerista* (Bell).

MM. Duméril and Bibron give the following synoptical analysis of this great work:—

Tetradactylus, *Seps*, *Siaphos*, *Heteromeles*, *Chelomeles*,

CYPRILEPIDS.
- Pedotes
  - Tetrapodes.
    - Saurophthalmes.
    - Ophiophthalmes
    - Typhlophthalmes.
  - Dipodes.
    - Propodes.
    - Hysteropodes.
- Apodes.

SAUROPHTHALMES.
- SAUROTITES
  - TELEODACTYLS. . . SCINCOIDS. *Scincus.*
  - ATELEODACTYLS.
    - HETERODACTYLS.
      - *Heteropus.*
      - *Champsodactylus.*
    - OMODACTYLS.
      - *Tetradactylus.*
      - *Tridactylus.*
- OPHIOTITES.

OPHIOPHTHALMES.
- SAUROTITES.
  - TELEODACTYLS. . *Ablepharis.*
  - ATELEODACTYLS.
    - HETERODACTYLS. *Gymnophthalmus.*
    - OMODACTYLS.
- OPHIOTITES. . .
  - OMODACTYLS.
  - HETERODACTYLS. *Lerista.*

TYPHLOPHTHALMES.

In Mr. Gray's last arrangement, the Scincoid Lizards of MM. Duméril and Bibron are comprised under the families *Scincidæ*, *Gymnophthalmidæ*, *Pygopidæ*, *Rhodonidæ*, and *Acontiadæ*, which consist of the following genera:—

Scincidæ.—a, *Scincus*, *Sphenops;* b, *Celestus*, *Trachysaurus*, *Tropidophorus*, *Egernia*, *Tiliqua*, *Amphiglossa*, *Euprepes*, *Eumeces*, *Leiolopisma*, *Psammita*, *Cyclodus*, *Adaria*, *Aprasia*, *Kerinia;* c, *Riopa*, *Lygosoma*, *Chiamela*, *Brachymeles;* d, *Ophiodes;* e, *Anguis*, *Ophiomorus*, *Siguana*, *Stenostoma*, *Dorfia*.

Gymnophthalmidæ.—*Microlepis*, *Ablepharis*, *Gymnophthalmus*, *Cryptoblepharis*, *Lerista*.

Pygopidæ.—*Pygopus*, *Lialis*.

Rhodonidæ.—*Rhodona*, *Soridia*.

Acontiadæ.—*Nessia*, *Evesia*, *Acontias*, *Dibamus*, *Typhline*.

MM. Duméril and Bibron, like Cocteau, divide their *Scincoïdians* or *Lepidosaurs* into three great divisions:—1, *Saurophthalms;* 2, *Ophiophthalms;* and, 3, *Typhlophthalms;* with the following genera, which are subdivided according to the conformation of the feet, toes, tail, rostral plate, muzzle, teeth, nostrils, and tongue:—

1. Saurophthalms.—*Tropidophorus*, *Trachysaurus*, *Cyclodus*, *Scincus*, *Sphenops*, *Gongylus*, *Diploglossus*, *Amphiglossus*, *Heteropus*, *Champsodactylus*, *Tetradactylus*, *Hemiergis*, *Seps*, *Nessia*, *Heteromeles*, *Chelomeles*, *Brachymeles*, *Brachystopus*, *Evesia*, *Scelotes*, *Præpeditus*, *Ophiodes*, *Anguis*, *Ophiomorus*, *Acontias*.

2. Ophiophthalms.—*Ablepharus*, *Gymnophthalmus*, *Lerista*, *Hysteropus*, *Lialis*.

3. Typhlophthalms.—*Dibamus*, *Typhline*.

For the subgenera we must refer to the work itself.

Organization and Habits.—There is nothing requiring particular observation in the organization and habits of the Scincoidians beyond what may be collected in this article and in those which treat of the genera belonging to the family. The harmless race live upon insects and other small animals, and the smoothness of their coats and shortness of their legs enable them to glide easily through small apertures.

Geographical Distribution of the Family.—MM. Duméril and Bibron give the following interesting account of the geographical distribution of this extensive family. The Scincoidians are, so to speak, spread over nearly the whole surface of the globe, for they are found in very high latitudes, even in countries where the lowness of the temperature would seem to forbid the existence of Reptiles; such, particularly, is the *Anguis fragilis* [BLINDWORM], which occurs as far north as Sweden, and perhaps farther. But of all the countries which produce Scincoidians, Oceania and New Holland are those which count the greatest number of species, whilst the Saurians of the other families show themselves in much fewer numbers than in the other parts of the world. The locality of certain Scincoidian Lizards is far from being limited to any particular country of the globe; thus *Gongylus ocellatus*, *Seps chalcides*, *Anguis fragilis*, and *Ophiomorus miliaris* live in the south of Europe and in the north of Africa. The *Plestiodon*[*] *quinquelineatum*, which was believed to be peculiar to North America, is found also in Japan; the *Lygosoma Quoyi*, *Lygosoma Labillardieri*, and many species of *Eumeces* are races common to Oceania and New Holland; and, what is still more worthy of the attention of naturalists, *Ablepharus Kitaibelii* exists in Hungary, Greece, and New Holland, whilst *Ablepharus Peronii* is found in both the two last countries equally, and moreover in the Isle of France and in South America.

Europe possesses *Gongylus ocellatus*. *Seps chalcides*, *Ablephari Menestriesii*, *Kitaibelii*, and *Peronii*, *Anguis fragilis*, and *Ophiomorus miliaris*.

Africa, with all these species except *Ablephari Menestriesii* and *Kitaibelii*, produces eighteen others, among which *Amphiglossus Gondotii* is a native of the Isle of Madagascar, and *Ablepharus Peronii* and *Leiolopisma Telfairi* are natives of the Isle of France.

Seventeen species are peculiar to Asia, and three others, one of which is also found in America, and the other two in Polynesia.

Fourteen Scincoïdians are natives of America, and of America only; and there are two others, one of which, *Plestiodon lineatum*, also inhabits Asia, and the other, *Ablepharus Peronii*, Europe, Africa, and Australia.

Polynesia possesses thirty-six species peculiar to itself, and to these must be added *Ablepharus Kitaibelii*, which is found also in Europe and in Asia; *Ablepharus Peronii*, which occurs also in Asia, Africa, and America; and *Lygosomata Quoyi* and *Labillardieri*, which belong also to Asia.

There is not a single Scincoidian whose geographical range is confined to Europe.

The genera *Scincus*, *Sphenops*, *Amphiglossus*, *Leiolopisma*, *Brachystopus*, *Scelotes*, *Acontias*, and *Typhline*, are peculiar to Africa; and *Tropidophorus*, *Champsodactylus*, and *Brachymeles* to Asia. The genera *Diploglossus*, *Ophiodes*, and *Gymnophthalmus*, are composed of American species exclusively; and *Tropidolopisma*, *Cyclodus*, *Trachysaurus*, *Heteropus*, *Tetradactylus*, *Hemiergis*, *Chelomeles*, *Nessia*, *Evesia*, *Præpeditus*, *Hysteropus*, *Lialis*, *Lerista*, and *Dibamus* belong to Polynesia.

The subgenus *Gongylus*, as well as the genera *Seps*, *Anguis*, and *Ophiomorus*, are common to Europe and Africa. *Eumeces* and *Lygosoma* are spread over Asia, America, and Polynesia. *Euprepes* is found in Africa, Asia, and Polynesia; *Plestiodon* in Africa, Asia, and America; and *Ablepharus* in Europe, Asia, Africa, America, and Polynesia.

We now proceed, as far as our space will admit, to attempt an illustration of some of the forms of this numerous group, from the division of *Saurophthalms*.

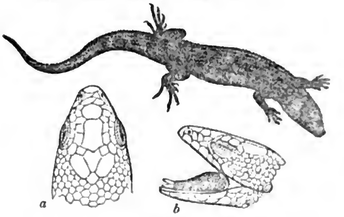
Tropidophorus, Dum. and Bibr. (*Leposoma*, Cuv., not Spix. *Tropidosaurus*, Gray, not Boié).

Generic Character.—Nostrils lateral, opening near the posterior border of the nasal plate. Tongue notched, squamous. Teeth simple, cylindrical, compressed at the summit. Palate not toothed, with a slight triangular notch situated rather backward. Auricular apertures closed by the membrane of the tympanum. Muzzle conical. Four feet, each terminated by five unequal, unguiculated toes, which are slightly compressed and without lateral dentilations. Body cyclotetragonal. Tail compressed, carinated. Scales of the upper parts lozenge-shaped, with a median carination prolonged into a point backwards.

Example, *Tropidophorus Cocincinensis*.

Description.—Upper part of the body brown-yellow, or inclining to olive, banded on the neck and back with much deeper brown, disposed so as to represent great ✕ placed one after the other. On the tail are spots, more or less large, of deep brown; and there is a row of whitish points along the lower region of the sides.

Locality.—Cochinchina. (Dum. and Bibr.)



Tropidophorus Cocincinensis.

Animal. *a*, head, seen from above; *b*, profile; mouth open to show the tongue.

Scincus. *Fitzing.*

Generic Character.—Nostrils lateral, opening between the nasal and supero-nasal anterior plates. Tongue notched, squamous. Teeth conical, simple, obtuse, blunt at the summit. Palate toothed, and with a longitudinal groove Auricular apertures operculated. Muzzle wedge-shaped, sharp, and truncated. Four feet, each terminated by five toes, which are tolerably equal, flattened, and serrated on the edges. Tail conical and pointed.

Example, *Scincus officinalis*.

Description.—MM. Duméril and Bibron remark that this species includes three varieties, which are very distinct in the colouring of their upper parts; for, in all cases, the lower and lateral regions, that is to say, the cheeks, the sides of the neck, those of the tail, as well as the sides, and, very often, the limbs, are of a silvery white, more or less pure.

Var. a.—General colour of the neck, back, and tail, yellow, or clear silvery grey, mixed with brown or blackish, which forms great spots dilated transversely, most frequently putting on the shape of transverse bands, the number of which is commonly seven or eight.

Var. b.—A yellow tint spread over the surface of the cranium. Neck, back, and a great part of the tail chesnut-brown, sprinkled with very small obscure whitish spots, two or three on each scale. Across the back five or six large white bands, with an irregularly dilated black spot at each of their extremities. These spots are not situated on the back, but on the most elevated part of the lateral regions of the trunk.

Var. c.—All the scales of the neck, back, and first half of the upper surface of the tail, silvery grey, widely radiated with white, with one or two brown spots on the posterior border of the radiations.

Locality and Habits.—MM. Duméril and Bibron state that this species, the Scink of the shops, appears to be peculiar to Africa, inhabiting the western and northern parts, but particularly the latter. They are certain that it is found in Senegal, from a fine specimen sent from that country by M. Heudelot to the Paris Museum. Bruce met with it in Syria and in Abyssinia. M. Rüppell observed it in the last country, and many travellers have seen it in Egypt, whence the greater portion of specimens with which collections are furnished are sent. It is at present rather common in Upper and Middle Egypt, and it appears from Belon and Rondeletius that it was there found abundantly in the sixteenth century, when it still was an object of commerce. In truth it was one of the most approved remedies in the antient Pharmacopœia, and was considered a sort of universal medicine, a specific against all kinds of maladies. Pliny (*Nat. Hist.*, xxviii. 8) proclaims the medicinal and renovating powers[*] of the *Scincus*, and quotes Apelles for its efficacy against wounds inflicted by poisoned arrows.

According to a communication made by M. Alexandre Lefebvre (who collected a number of individuals of this species in an excursion, undertaken in 1828, to the oasis of Bahrieh) to MM. Duméril and Bibron, this species is met with on the little hillocks of fine and light sand which the south wind accumulates at the foot of the hedges that border the cultivated lands, and of the tamarisks which try to vegetate on the confines of the desert. There it may be seen peaceably basking in the rays of a burning sun, or chasing from time to time the *Graphipteri* and other *Coleoptera* which pass within its range. It runs very quickly, and, when menaced, buries itself in the sand with singular rapidity, hollowing out for itself a burrow many feet deep in a few instants. When taken, it endeavours to escape, but does not attempt to bite nor to defend itself with its claws.

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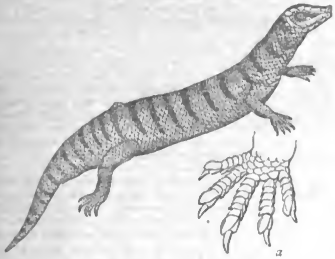
[*] One of the subgenera of *Gongylus*.

[*] 'Afferuntur salsi. Rostrum ejus et pedes in vino albo poti, cupiditates veneris accendunt,' &c.

The better opinion seems to be that this is the Σκιγκος of Dioscorides and the *Scincus* of Pliny; and though the descriptions given by the antients are not sufficiently accurate to enable us to pronounce positively on its identity, enough remains in tracing its history downwards to render it highly probable that such is the fact.



Scincus officinalis. Five-ninths of nat. size.
a, fore foot, seen from above.

Sphenops. *Wagl.*

Generic Character.—Nostrils lateral, each opening between the nasal and the rostral plates. No supero-nasal plates. Tongue notched, squamous. Teeth conical, pointed, straight, simple. Palate not toothed, but with a longitudinal groove. Two auricular apertures. Muzzle wedge-shaped, rounded. Four feet, each terminated by five unequal, subcylindrical, unguiculated toes, without lateral dentilations. Sides angular at their lower region. Tail conical, pointed.

Example, *Sphenops capistratus.*

Description.—Colour ferruginous grey, more or less yellow, or brownish on the upper parts. From nine to thirteen longitudinal stripes composed of so many successions of black points placed on the lateral borders of the scales. These stripes, which spring on the occiput and the posterior region of the temples, run along the neck, the back, and the tail throughout its whole length, or nearly so. The upper surface of the limbs presents also generally rows of black points. The scales are also fringed with brown. On the sides of the head is a small black band commencing at the nostril, passing upon the eye, traversing the temple, and losing itself upon the neck. The lower parts of the animal are white.

Locality and Habits.—This *Sphenops* is widely spread in Egypt, the only country known to MM. Duméril and Bibron where it has yet been found. M. Rüppell and M. A. Lefebvre sent specimens—the last-named traveller the most abundantly—to France, and M. Lefebvre informed MM. Duméril and Bibron that it was very common in the oasis of Bahrieh, at Zabou, Qasr, and Bahoueit. He brought home more than a hundred individuals which he captured himself. Both M. Lefebvre and Cocteau state that the animal only burrows to a small depth, for the slightest disturbance made by the feet of the passer by discovers its retreat.

Head of Sphenops capistratus.

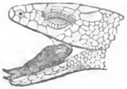
It is very active in its movements, but suffers itself to be taken without attempting to defend itself. M. Lefebvre brought an embalmed individual of this species from Egypt. This he gave to Cocteau, who drew up an interesting memoir (extracted by MM. Duméril and Bibron), which he was about to publish when death arrested him in his scientific career.

Diploglossus. *Wiegm.* (*Celestus*, part. *Tiliqua*, part. Gray).

Generic Character.—Nostrils lateral, each opening in a single plate (the nasal); supero-nasal plates; tongue notched, with squamiform papillæ in front, and filiform papillæ behind; conical teeth; palate not toothed, but with a longitudinal groove; muzzle obtuse; four feet, each terminated by five unequal, unguiculated, compressed toes without lateral dentilations; palms and soles of the feet tubercular; sides rounded; tail conical or slightly compressed, pointed; scales striated.

Example, *Diploglossus Sagræ.*—Form resembling that of *Seps* in the slenderness of the body, the length of the tail, and the shortness of the limbs; colour brown-ash, with metallic reflections on the upper parts of the head, trunk, tail, and limbs, more or less deep in different individuals; on each side of the body a black band which springs on the frenal region, passes on the eye and temple, extends the whole length of the side, and loses itself on the side of the tail, at some distance from its origin; the labial plates are yellowish, bordered with black, and the lower regions have also a yellowish tint, but with silvery reflections.

Locality and Habits.—Cuba, where it lives on land in cool places and light and humid lands. It is very quick in its motions



Head of Diploglossus Sagræ. Mouth open to show the tongue.

Gongylus. *Dum.* and *Bibr.*

Generic Character.—Nostrils lateral, pierced either in a single plate (the nasal) or in two plates (the nasal and the rostral); tongue notched, squamous; teeth conical, often slightly compressed, and, as it were, wedge-shaped, simple; palate toothed or not toothed, with a posterior notch or a longitudinal groove; auricular apertures; four feet, each terminated by five unguiculated, unequal, slightly compressed toes without dentilations; sides rounded; tail conical or slightly flattened laterally, and pointed.

Example, *Gongylus ocellatus.*

Description.—The form of this species is heavy and stout, and it varies greatly in colour. MM. Duméril and Bibron record the following varieties:—

Var. a.—Upper part of the body sprinkled, on a bronze ground, inclining more or less to yellow or brownish, with small black spots ordinarily relieved with a white or yellowish trait in the middle, whence the name, *ocellatus;* sometimes the white mark more or less obliterates the black spot, or exists alone. These marks uniting give place to the formation of small black bands relieved with white, directed more or less transversely to the axis of the body, forming angles more or less sinuous, and more or less suddenly interrupted. The number and disposition of these zigzags are very inconstant, and they are in general less frequent on the tail and limbs. Their width and length depend on the size and number of the spots which compose them. Sometimes these spots uniting laterally in a successive and regular manner, form also transversal lines with some space between them, which gives the animal an annulated aspect. On the tail especially this disposition is most frequent. At other times these spots correspond from before backwards, and define from ten to twelve longitudinal rows of white points, separated by rows of black spots. It sometimes happens that the white spots disappear, and the black ones only remain. Sometimes, on the contrary, the black spots are effaced, and the white spots remain. In general, the plates of the head are bordered irregularly with black.

Var. b.—A greater number of longitudinal rows of ocellations on the back, and a yellow band on each side of it.

Var. c.—Nearly the same as *Var. a*, but with a black band more or less spotted with white, and surmounted with a pale yellow or whitish line.

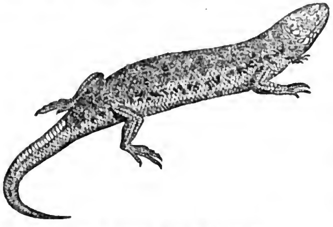
Var. d.—No ocellations on any part of the body. Back of a uniform bronze tint. A beautiful and large black band springs before or behind the eye, passes on the temple, then above the tympanum, along the neck, the side of the back, and ends on the tail, at a small distance from the origin of the thigh. This black band is made the more conspicuous by as large a whitish band above it. Labial plates white, bordered with black.

Var. e.—Upper part of the head, cervical region, back and upper part of the tail, of a bronze hue, strongly tinted with greyish, on which are perceptible traces of ocellations; but the lateral parts of the head and of the neck, the sides, the sides of the tail, and the limbs entirely, are deep ebony-black.

This is the *Scincus ocellatus* of authors; *Tiliqua ocellata* and *Lacépède's Galleywasp* of Gray.

Locality and Habits.—This species is spread over the whole of the shores of the Mediterranean; but it is in Sicily, Sardinia, Malta, the antient Cyprus, and Egypt, that it is especially found. MM. Quoy and Gaimard captured a specimen in the Isle of Teneriffe, and it is said to have been found in the south of France; but MM. Duméril and Bibron are not sure of this.

Dry and slightly elevated spots are chosen by this scink, and there it hides itself in the sand or under stones. Its food consists of small insects, which it seizes after the manner of the true Lizards. It suffers itself to be caught without defending itself; and though its movements are not so rapid as those of the Lizards, it possesses more agility than its form would lead one to expect.



Gongylus ocellatus. Five-ninths of nat. size.*

Seps. *Daud.* (*Zynis*, Oken, Fitzing., Wiegm.)

Generic Character.—Nostrils lateral, opening between two plates, the nasal and the rostral. Supero-nasal plates. Tongue flat, squamous, of an arrow-head shape, notched at its point. Teeth conical, simple. Palate not toothed, but with a very large groove in the second half of its length. Auricular apertures. Muzzle conical. Four feet, each having their extremity divided into three unequal, unguiculated, subcylindrical toes, without dentilations. Sides rounded. Tail conical, pointed. Scales smooth.

Example, *Seps Chalcides*, Bonap.

Description.—Form slender and serpentine. MM. Duméril and Bibron enumerate the following varieties:—

Var. a. Upper parts coppery or bronzed grey: two longitudinal lines on the back dotted with black.

Var. b. Two black stripes on the right and left of the back, instead of the two white lines.

Var. c. The two black stripes which extend on each side of the back wider and more distant, and separated from each other by a yellow or whitish band.

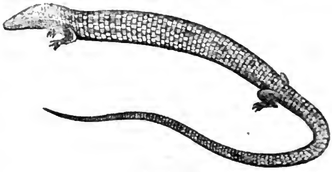
Var. d. Same as *Var. b*, with two additional black stripes on the middle of the back.

Var. e. Upper part of the body marked with eight or nine black stripes, alternating with as many yellow or whitish stripes.

Var. f. Apparently uniform olive-brown, so pale are the eight or ten greyish lines which run in a longitudinal direction.

In all these different varieties the lower parts are more or less greyish or whitish.

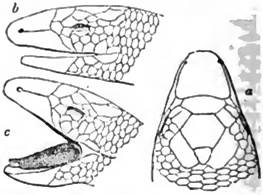
Locality; Habits.—The south of France, Italy, all the islands of the Mediterranean, Spain, and all the Mediterranean shore of Africa, claim this species as a resident. It is viviparous, and lives upon worms, small terrestrial mollusks, spiders, and, in short, all kinds of insects.



Seps chalcides.

Acontias. *Cuv.*

Generic Character.—Muzzle conical, inserted in a great plate. Nostrils opening on each side of this sort of rostral case, and having each, posteriorly, a longitudinal slit. Tongue flat, of an arrow-head shape, squamous, very slightly notched at the point. Teeth conical, obtuse. Palate not toothed, but with a longitudinal groove. Only one eyelid (the lower). No auricular apertures. No limbs. Tail short, conical, truncated as it were. Scales smooth.



Head of Acontias.

a, seen from above; *b*, profile; *c*, the same view, with the mouth open to show the tongue.

Example, *Acontias meleagris.*

Locality.—South Africa: very common near the Cape of Good Hope. [Acontias; Blindworm; Javelin-Snake.]

SCINDE. [Sinde.]

SCIO. [Chios.]

SCIOPPIUS, CASPAR, was born on the 27th of May, 1576, at Neumark in the Palatinate (Pfalz). His family was poor; but although he attacked Scaliger for his pretensions, he was very anxious to be considered of noble descent. At the age of seventeen he published some Latin poems which were very favourably received. After the completion of his studies, he travelled into Italy, and in 1589 he was at Ferrara, where he wrote a panegyric on Pope Clemens VIII. and the king of Spain. The pope became his protector and patron, and Scioppius followed him to Rome, where he renounced the Protestant religion, and the pope gave him the title of a knight of St. Peter, and soon afterwards made him Comes Apostolicus de Claravalle. In consequence of his conversion, Scioppius studied theology, and published several little works, partly to justify his own conduct and partly to support the cause of the pope against the Protestants. But the study of antient literature was not neglected: he also published an edition of Varro, 'De Ling. Lat.,' Ingoldstadt, 1602, 8vo.; 'Commentaries on Appuleius and the Priapea,' Frankfort, 1606, 12mo., and reprinted at Padua, 1664, 8vo., with notes of Scaliger and Lindenbrog. Scioppius had hitherto been well disposed towards Jos. Scaliger, but some remarks respecting his conversion to Catholicism, and Scaliger's letter to Douza, provoked the enmity of Scioppius, which was displayed in his 'Scaliger Hypobolimaeus, hoc est, Elenchus Epistolæ Joan. Burdonis, pseudo-Scaligeri, de Vetustate et Splendore Gentis Scaligeræ,' Maynz, 1607, 4to. In this book he ridiculed with the bitterest satire the pretensions of Scaliger, and attacked king Henry IV. of France for having granted civil liberty to the Protestants. As the book was against Protestants in general, the dispute was taken up by several persons of both parties, and was carried on for many years. In 1608 Scioppius published several other works against the Protestants. In the year following he travelled to Italy, and at Venice, which was involved in some dispute with the pope, Scioppius endeavoured to persuade Paolo Sarpi to join the party of the pope. The consequence of this attempt was that Scioppius was thrown into prison; but being soon restored to liberty, he visited Vienna, where he found a more favourable reception. The emperor not only made him councillor to his court, but raised him to the rank of count palatine. In 1611 he published two works, one called 'Ecclesiasticus Autoritati Ser. D. Jacobi, Magnæ Britanniæ regis, oppositus, Hartberg, in 4to., and the other called 'Collyrium Regium, Ser. D. Jacobo, Magnæ Britanniæ regi, graviter oculis laboranti, omnium Catholicorum Nomine, gratæ voluntatis causa, muneri misum; una cum Syntagmate de Cultu et Honore,' in 8vo. Both books were mainly directed against King James I. of England, but the first also contained fresh attacks on Henry IV. of France. In Paris and in London the books were publicly burnt by the hangman, and in London Scioppius was hanged in effigy (1612). Scioppius returned to Italy, but after a short stay there, he went, in 1613, to Madrid. Here he became acquainted with the grammatical work of Sanchez, commonly known under the name of Sanctii Minerva, which turned his attention to grammatical speculations, and which he subsequently made known in other parts of Europe. He had not been long in Madrid when one evening he was dreadfully beaten by some servants of the English ambassador, who, it is possible, had ordered his servants to punish Scioppius for his insolence towards his royal master. Scioppius, not thinking himself safe in Spain, fled to Ingolstadt, where he published his 'Legatus Latro,' addressed against the English ambassador. Casaubon had defended the King of England, and this circumstance gave Scioppius an opportunity of resuming his warfare against the Protestants. In 1617 he again went to Italy, and settled at Milan, ever continuing his bitter enmity against the Protestants, who, as he now declared, ought all to be exterminated, with their women and children. This proclamation of a religious war is contained in his 'Classicum Belli Sacri, sive Heldus redivivus,' Pavia, 1619. When his rage had become exhausted, he returned for a time to philological studies, and wrote several very good grammatical works. But this quiet mode of life did not suit his quarrelsome temper. In 1630 he returned to Germany, and requested from the diet of Regensburg a pension for his services, which being refused through the influence of the Jesuits, he became the most furious enemy of their whole order, though he had before frequently lent them his support. His first works against the Jesuits appeared without his name; but in 1634 he attacked them openly in a work called 'Astrologia Ecclesiastica.' When he saw that his own life became endangered by these ferocious attacks, he retired to Padua, where he began to occupy himself with writing a commentary on the Apocalypse, but before he had completed this work he died, on the 19th of November, 1649.

Scioppius was a man of immense learning, of a prodigious memory, and of great acuteness. In his knowledge of the Latin language he had no equal. With his talents and learning, he might have been as great a man as Jos. Scaliger; but his quarrelsome disposition, his strong inclination to satire, and his intolerance, constantly involved him in disputes which reflect discredit upon his character. There are nevertheless among his numerous works some which are still very useful to scholars, especially those on the Latin language. The number of his works is stated to be one hundred and four, but he did not publish them all under his real name; many appeared under the fictitious names Nicodemus Macer, Oporinus Grubinius, Pascasius Grosippus, Holofernes Krigsœderus, Mariangelus a Fano, and others. The following list contains the most important of his works which have not been already mentioned:—'Verisimilium Libri Quatuor, in quibus multa veterum Scriptorum loca emendantur, augentur, et illustrantur,' Nürnberg, 1595, and Amsterdam, 1662, 8vo.; 'Suspectarum Lectionum Libri Quinque, in quibus amplius ducentis locis Plautus, plurimis Appuleius, Diomedes Grammaticus, et alii, corriguntur,' Nürnberg, 1597, and Amsterdam, 1664, 8vo.; 'De Arte Critica et præcipue de altera ejus parte emendatrice, quænam ratio in Lat. Scriptoribus ex ingenio emendandis observari debeat Commentariolus,' Nürnberg, 1597, and Amsterdam, 1662, 8vo.; 'Elementa Philosophiæ Stoicæ Moralis,' Maynz, 1606, 8vo.; 'Grammatica Philosophica, sive Institutiones Grammaticæ Latinæ,' Milan, 1628, 8vo. (a new edition with additions appeared at Amsterdam, 1664, 8vo., and another at Franeker in 1704); 'Paradoxa Literaria, in quibus multa de literis nova contra Ciceronis, Varronis, Quinctiliani, aliorumque literatorum hominum, tam veterum quam recentiorum, sententiæ disputantur,' Milan, 1628, and Amsterdam, 1659, 8vo. (this work was published under the assumed name of Pascasius Grosippus); 'Auctarium ad Grammaticam Philosophicam, ejusque Rudimenta,' Milan, 1629, and Amsterdam, 1664, 8vo. (published under the name of Mariangelus a Fano); 'Arcana Societatis Jesu publico bono vulgata, cum Appendicibus utilissimis,' 1635, 8vo.; 'Consultationes de Scholarum et Studiorum Ratione, deque Prudentiæ et Eloquentiæ parandæ Modis,' Padua, 1636, 12mo., and Amsterdam, 1660 and 1665, 8vo.; 'Mercurius Quadrilinguis, id est, de Linguarum ac nominatim Latinæ, Germanicæ, Græcæ, et Hebraeæ nova et compendiaria Discendi Ratione,' Basel, 1637, 8vo. Scioppius also wrote notes on the 'Minerva' of Sanctius, which first appeared at Padua in 1663, and which have subsequently been incorporated in the various editions of the 'Minerva.'

SCIOTO, River. [Mississippi, River.]

SCI'PIO is the name of a family belonging to the patrician gens Cornelia. This illustrious family produced some of the greatest men in Roman history; we shall subjoin a complete list of those members of the family whose names have been handed down by historical records. The first Scipio mentioned in Roman history is

1. **P. Cornelius Scipio**, whom, in 396 B.C., the dictator Camillus appointed master of the horse. (Liv., v. 19.) The Fasti of this year however do not mention him, but state that P. Cornelius Maluginensis was the magister equitum of Camillus. A short time afterwards (394 B.C.) Scipio is mentioned among the military tribunes (Liv., v. 24), and a second time in the following year. (Liv., v. 26.) In the year 389 he was appointed interrex (Liv., v. 31), and two years after he held the same office a second time.

2. **P. Cornelius Scipio** is mentioned as one of the first curule ædiles, which office was instituted in 366 B.C. He is probably the same man who was magister equitum under Manlius, 350 B.C. (Liv., vii. 24.)

3. **L. Cornelius Scipio** was interrex in 352 B.C. (Liv., vii. 21.)

4. **P. Cornelius Scipio Barbatus** was, according to the Fast. Cons., consul with C. Plautius in the year 328 B.C.; but Livy (viii. 22) calls the colleague of Plautius P. Cornelius Scapula. Scipio Barbatus was made dictator in 306 B.C., to hold the comitia for the election of the consuls, for the actual consuls were engaged in a war against the Samnites. (Liv., ix. 44.) A year later he appears as pontifex maximus. (Liv., ix. 46.)

5. **L. Cornelius Scipio** was consul in 298 B.C., and gained a victory over the Etruscans in the neighbourhood of Fregellæ. (Liv., x. 12.) He is probably the same who, three years afterwards (295 B.C.), appears in another war against the Etruscans; and was left as proprætor at the head of the Roman camp while the prætor Appius went to Rome. (Liv., x. 25, 26.)

6. **Cn. Cornelius Scipio Asina.** He is the first member of the family from whom we are able to trace the pedigree of the Scipios with certainty. The story about the origin of his surname Asina is related by Macrobius. (*Sat.*, i. 6.) He was consul at the time of the first Punic war (260 B.C.), together with C. Duilius, and obtained the command of the fleet; but in his attempt to take the island of Liparæ, he was blocked up by the Carthaginians with seventeen vessels in a port of the island. His soldiers escaped on land, but Scipio himself surrendered to the enemy. (Polyb., i. 21.) Livy (*Epit.*, 17) gives another account of the manner in which he was made prisoner. He must however have obtained his liberty soon after, for he was consul a second time in the year 254 B.C. (Val. Max., vi. 9, 11), with A. Atilius Calatinus. He and his colleague took Panormus, the largest town in the Carthaginian part of Sicily, and then returned to Rome in triumph. (Polyb., i. 38.) Further particulars of his life are not known.

7. **P. Cornelius Scipio Asina**, son of Cn. Cornelius Scipio Asina. He was consul, in 221 B.C., with M. Minucius Rufus, and made a successful campaign against the Istri, who harassed the Romans by their piracy. (Oros., iv. 13.) Four years after (217 B.C.) he was appointed interrex, to hold the comitia for electing the consuls. (Liv., xxii. 34.) In the year 211 B.C., when the news arrived that Hannibal was advancing with his army towards Rome, it was Scipio's advice to give up all Italy, and to draw all the armies within the walls of the city. (Liv., xxvi. 8.)

8. **L. Cornelius Scipio**, a brother of Cn. Cornelius Scipio Asina. He was consul, in 259 B.C., with C. Aquillius Florus. He put the fleet of the Carthaginians to flight, and attacked them in Corsica and Sardinia, and destroyed the towns of Aleria and Olbia. For these services he was honoured with a triumph. (Liv., *Epit.*, 17; Flor., ii. 2, 16; Val. Max., v. 1, 2.) The year after his consulship (258 B.C.) he is mentioned in the *Fast. Cap.* as censor.

9. **P. Cornelius Scipio**, son of L. Cornelius Scipio. He was consul in the first year of the second Punic war (218 B.C.). While his colleague T. Sempronius Longus was sent with the fleet to Sicily, Scipio went to Spain; but when he heard that Hannibal was already preparing to cross the Rhodanus (Rhône), he returned by sea to Massilia. The sufferings of his soldiers from this voyage prevented him from going up the Rhône immediately; and when, after the lapse of three days, he set out to meet Hannibal, the latter had already advanced into the interior of Gaul. Scipio therefore sent a part of his troops, under his brother Cneius, who was his legate, to Spain, and with the rest he embarked for Italy, to join the other Roman forces there, and to attack Hannibal on his descent from the Alps. An engagement between the Carthaginian and Roman horse took place on the Ticinus, in which the Romans were defeated, and Scipio was wounded, and compelled to retire across the river Po. He took up a position near Placentia, but he was induced by the Gauls to fortify himself on the Trebia, and to wait for the arrival of Sempronius, who had been called back from Sicily. When the latter arrived, Scipio, still suffering from his wound, advised him not to engage in a battle with Hannibal; but Sempronius, anxious to strike a decisive blow, and seeing that the enemy only profited by delay, offered battle. He was defeated, and the Carthaginians became masters of nearly the whole of Northern Italy. (Polyb., iii. 40, &c.; Liv., xxi. 32, &c.)

In the summer of the year 217 B.C., Scipio, whose imperium was prolonged at the end of his consulship, went to Spain with a fleet of 20 ships and 8000 land-troops (Polyb., iii. 97), to join his brother Cneius, who had already achieved important things in that country. His intention was to drive the Carthaginians from Spain, and thus to cut off the supplies which Hannibal was to receive from that quarter. Cneius on his arrival from Massilia had landed at Emporium, and soon after the greater part of the eastern coast of Spain declared for him. His mildness also induced several of the inland tribes, who were discontented with the oppressive rule of the Carthaginians, to join the Romans. A battle near the town of Scissis, in which the Carthaginians were defeated and their general Hanno taken prisoner, made the Romans masters of nearly the whole country between the Iberus (Ebro) and the Pyrenees. Cneius now took up his winter-quarters at Tarraco (Tarragona). (Liv., xxi. 60, &c.; Polyb., iii. 76.) In the year following, a short time before his brother Publius arrived, Cneius defeated the Carthaginian fleet in the mouth of the Iberus. (Liv., xxii. 20; Polyb., iii. 96, &c.) About the middle of the summer Publius arrived, and the two brothers marched against Saguntum, where Hannibal had left the Spanish hostages on his setting out towards Gaul. The treachery of a Spaniard, called Abelux or Abilyx, delivered them up to the Scipios, who wisely sent them home to their relatives, and thus gained a hold on the affections of a great number of Spanish tribes, who gladly shook off the yoke of the Carthaginians. In 216 B.C. the Scipios gained a victory at Ibera over Hasdrubal, who, after the arrival of a fresh Carthaginian army under Himilco, intended to make a landing in Italy and to support his brother there. The whole army of Hasdrubal was defeated and routed, his camp was taken, and he himself escaped with only a few followers. (Liv., xxiii. 28, &c.) The Spaniards, who had been heavily taxed by the Carthaginians, willingly submitted to the Romans, but the Scipios knew the fickleness of the Spaniards, and, in order to keep up friendly relations with them, they did not levy any heavy contributions, but applied to the senate at Rome to provide them with the means of supporting their armies. In the meanwhile Mago arrived with another army from Africa, and laid siege to the revolted town of Illiturgi on the Baetis. Here again the Scipios gained a great victory, and soon after another near Intibili, where the Carthaginians on their flight from Illiturgi had taken refuge. In the year 214 B.C. the important town of Castulo deserted the cause of the Carthaginians and joined the Romans, and when the former made a new attempt against Illiturgi, they were beaten by Cneius, and completely defeated in the neighbourhood of Munda. They were not more successful in several other attempts. During the following year the Carthaginians were engaged in a war in Africa against Syphax, and the Scipios had time to strengthen themselves in Spain. But the uninterrupted series of brilliant victories of the Scipios was now at an end. In 212 B.C. the Carthaginians resumed the war in Spain, and took 20,000 Celtiberians into their pay. Publius Scipio commanded two-thirds of the Roman forces, and was arrayed against Mago, Hasdrubal, son of Gisco (who were supported by Massinissa), and the Spanish chief Indibilis. Cneius was opposed to Hasdrubal Barcas. Publius, in his assault on the ranks of Indibilis, was cut down with the greater part of his army. His brother Cneius, abandoned by the faithless Celtiberians, withdrew as far as he could. From the manœuvres of the enemy, he conjectured the fate of his brother. On his retreat he found himself at last compelled to make a stand upon a hill which was of such a nature that it was impossible for him to fortify himself. Nearly the whole of his army was cut to pieces, and Cneius himself fell among the rest, 29 days after the death of his brother. The catastrophe took place in the spring of the year 211 B.C. (Becker, 'Vorarbeiten zu einer Geschichte des Zweiten Punischen Krieges,' in Dahlmann's *Forschungen*, ii. 2, p. 113.)

10. **Cn. Cornelius Scipio Calvus**, the brother of P. Corn. Scipio (No. 9). His exploits in Spain have just been described. He was consul, in 222 B.C., with M. Claudius Marcellus, with whom he made an expedition against the Insubrians, and took Acerræ and Mediolanum. (Polyb., ii. 34; Plut., *Marcell.*, 6.) At the beginning of the second Punic war he went, as we have seen, to Spain as legate to his brother Publius.

11. **P. Cornelius Scipio Africanus Major**, the son of P. Cornelius Scipio (No. 9). If it be true that at the age of seventeen he fought in the battle of the Ticinus (218 B.C.), and rescued his wounded father, he must have been born in 235 B.C. He was in the battle of Cannæ (216 B.C.) as a tribune, and was among those who after the defeat escaped to Canusium. Here the chief command of the remaining troops was unanimously entrusted to him and Appius Claudius Pulcher. (Liv., xxii. 53.) On this occasion it was owing to his presence of mind that the remnants of the Roman army did not in their despair quit Italy. (Val. Max., v. 6, 7.) In 212 B.C. Scipio was curule ædile, though he had not yet attained the legitimate age. The tribunes of the people endeavoured to prevent his election, but they were obliged to give up their opposition, for the people, who seem to have perceived the extraordinary abilities of the young man, elected him almost unanimously. (Liv., xxv. 2.) In 211 B.C. his father and uncle fell in Spain, and the Carthaginians again took possession of the country, which they had almost entirely lost. When Capua had fallen again into their hands, and Italy no longer required their exclusive attention, the Romans determined to act with more energy against the Carthaginians in Spain. On the day of the election, no one ventured to come forward to undertake the command in this war. Young Scipio, then scarcely 24 years of age, at last offered to take the command of the army in Spain. The people were struck with admiration at the courage of the young man, and gave him the command with proconsular power, which was afterwards prolonged to him for several years (210-206 B.C.).

The extraordinary power which young Scipio exercised over his contemporaries was perhaps partly owing to superstition, for he was believed to be a favourite of the gods. Ever since he had taken the toga virilis, he went every morning into the Capitol, where he spent some hours in solitude and meditation. Hence all he did was considered by the people to be the result of his intercourse with the gods. Scipio himself undoubtedly partook in this opinion, and cherished it; and the extraordinary success of all his enterprises must have strengthened his belief. Towards the end of the summer, in 210 B.C., or, as Livy (xxvi. 41) says, at the beginning of spring, Scipio set out for Spain with an army of 11,000 men, landed at the mouth of the Iberus, and undertook the command of the whole Roman forces in Spain. He was accompanied by his friend Lælius. He first object was to gain possession of New Carthage, where the Carthaginians kept their Spanish hostages. Lælius made the attack with the fleet from the sea-side, while Scipio conducted the operations on land. The town soon fell into the hands of the Romans, and the generosity with which Scipio treated the Spanish hostages gained over a great number of Spaniards. The hostages of those tribes who declared themselves allies of the Romans were sent home without ransom. A short time after the conquest of this place Scipio went to Tarraco, where he received embassies from various Spanish tribes, who offered to become the allies of the Romans or to recognise their supremacy. Scipio is said not to have set out against Hasdrubal until the year following, but it can scarcely be conceived why the Carthaginians should have been so long inactive, and it is a probable supposition that the battle with Hasdrubal, which Livy and Polybius assign to the year 209 B.C., was fought very soon after the taking of New Carthage. (Zonaras, ix. 8.) In this battle Scipio gained a great victory; 8000 Cathaginians were slain, and 22,000, with their camp, fell into the hands of the victor. Many of the Spaniards now wished to proclaim Scipio their king, but he refused the honour. (Liv., xxvii. 19; Polyb., x. 40.) Hasdrubal fled with the remainder of his army towards the Tagus and the Pyrenees. Scipio did not follow him, partly because he thought his enemy too much weakened to be dangerous, and partly because he feared lest he might expose himself to the combined attacks of the two other Carthaginian generals, Mago, and Hasdrubal, son of Gisco. Hasdrubal Barcas, the defeated general, however, had carried considerable wealth with him in his flight, and with these means he raised an army in Spain, to lead into Italy to the assistance of his brother Hannibal, hoping thus to bring the war to an end in Italy. During these preparations of Hasdrubal, Scipio was engaged against the two other Carthaginian generals, one of whom (Mago) was defeated, in 208 B.C., by the proprætor Silanus, in the country of the Celtiberians, and Hanno, who came with an auxiliary army from Africa, was taken prisoner. After this success of the proprætor, Scipio united his forces with those of Silanus to attack Hasdrubal, son of Gisco. But as this general had retired to the south of Spain, and had distributed his army in the fortified places on the Bætis as far as Gades, Scipio (through his brother Lucius) only took the important town of Oringis, and then gradually returned across the Iberus. The power of the Carthaginians in Spain was however already broken, and in the year following (207 B.C.) Scipio gained possession of nearly all Spain by a victory, the place of which is not clearly ascertained, some calling it Silpia or Bæcula, some Ilipa, and others Carmo. Scipio, now in the almost undisputed possession of Spain, began to turn his eyes to Africa, and, accompanied by his friend Lælius, he ventured to pay a visit to king Syphax, with whom Lælius had already commenced negotiations. Here Scipio is said to have met Hasdrubal, son of Gisco, and to have made a very favourable impression on Syphax as well as on Hasdrubal. After a short stay in Africa, Scipio returned to Spain, where he first punished several towns for their faithlessness, and subdued some of the Spanish chiefs who ventured to claim their former independence. During these occupations Scipio was attacked by a severe illness, from which however he recovered in time to quell an insurrection of 8000 Roman soldiers, who were discontented from not having derived from their conquests those advantages which they had expected, and who are said also to have been bribed by the Carthaginians. Mago had in the meanwhile withdrawn to the Balearic Islands, and thence to Liguria. Gades, the last place which the Carthaginians possessed in Spain, was now taken from them, and thus the war in Spain was at an end.

Towards the close of the year 206 B.C., Scipio surrendered the command of the Roman forces in Spain to the proconsuls L. Lentulus and L. Manlius Acidinus, and returned to Rome. (Liv., xxviii. 38.) He delivered to the ærarium the immense treasures which he brought from Spain. He evidently wished for a triumph, but the senate paid no attention to his wishes, for no one had ever triumphed at Rome before he had held the consulship. In the year 205 B.C., Scipio was made consul with P. Licinius Crassus, who was at the same time pontifex maximus, and was consequently not allowed to leave Italy. If therefore a war was to be carried on abroad, the command necessarily devolved upon Scipio. His wish was immediately to sail with an army to Africa, but the more cautious senators, and especially Q. Fabius, were decidedly opposed to his plan, partly because Hannibal, as long as he was in Italy, appeared too formidable to be neglected, and partly perhaps because they were influenced by jealousy. All that Scipio could obtain was that Sicily should be assigned to him as his province, with 30 vessels, and with permission to sail over to Africa in case he should think it advantageous to the republic. But he did not obtain from the senate permission to levy an army, and he therefore called upon the Italian allies to provide him with troops and other things necessary for carrying on the war. As they were all willing to support the conqueror of the Carthaginians in Spain, he was soon enabled to sail to Sicily with nearly 7000 volunteers and 30 ships. (Liv., xxviii. 45, &c.; Plut., *Fab. Max.*, 25.) Soon after his arrival in Sicily he sent his friend Lælius with a part of his fleet to Africa, partly to keep up the connection which he had formed there, on his visit from Spain, with Syphax and Massinissa (for to the latter Scipio had sent back a nephew who had been taken prisoner in the battle of Bæcula), and partly to show to his timid opponents at Rome how groundless their fears were. He himself employed his time in Sicily most actively in preparing and disciplining his new army.

Massinissa, dissatisfied with the Carthaginians, was anxious for the arrival of Scipio in Africa, but Syphax had altered his policy, and again joined the Carthaginians. The enemies of Scipio at Rome at last got an opportunity of attacking him, and they nearly succeeded in depriving him of his post. Without being authorized by the senate, Scipio had taken part in the conquest of Locri in Southern Italy, and had left his legate Q. Flaminius as commander of the Roman garrison in that place. The legate treated the Locrians with such severity and cruelty, that they sent an embassy to Rome to lay their complaints before the senate. As Scipio, although acquainted with the conduct of Flaminius, had nevertheless left him in command, his enemies attacked him on this and other grounds, and Fabius Maximus even proposed that he should be recalled. A commission was sent out to inquire into the state of affairs, and to bring Scipio home, if the charges against him were found true. Scipio proved that his army was in the best possible condition; and the commissioners were so surprised at what they saw, that instead of recalling the consul, they bade him sail to Africa as soon as he might think it proper, and to adopt any measures that he might think useful. Scipio in consequence of this sailed, in 204 B.C., as proconsul, with a large army, from Lilybæum to Africa, and landed in the neighbourhood of Utica. Here he made successful incursions into the neighbouring country, and Hasdrubal, who attempted to prevent them, suffered a great defeat. But Scipio could not gain possession of Utica, which was of the greater importance to him and his fleet, as the winter was approaching, and he was obliged to spend the season on a piece of land extending into the sea, which he fortified as well as he could. Towards the close of the winter the Carthaginians, united with Syphax, intended to make a general attack on Scipio's army and fleet, but being informed of their plans, he surprised the camps of Hasdrubal and Syphax in the night, and only a small number of the enemy escaped. Syphax withdrew into his own dominions, but was defeated by Massinissa and Lælius, and taken prisoner with his wife and one of his sons. Massinissa married Sophonisba, the wife of Syphax, who had formerly been engaged to him, but had been given to Syphax for political reasons. Scipio, fearing the influence she might have on Massinissa (for she was a Carthaginian), claimed her as a prisoner belonging to the Romans, and Massinissa poisoned her, to save her from the humiliation of captivity. The fears and apprehensions of the Carthaginians now increased to such a degree that they thought it necessary to recall Hannibal from Italy, and at the same time they sued for peace. The terms which Scipio proposed would have concluded the war in a manner honourable to the Romans. The Carthaginians however, whose only object was to gain time, made no objections to the conditions, but only concluded a truce of forty-five days, during which an embassy was to be sent to Rome. Before this truce was at an end, the Carthaginian populace plundered some Roman vessels with provisions, which were wrecked off Carthage, and even insulted the Roman envoys who came to demand reparation. Scipio did not resent this conduct, and allowed the Carthaginian ambassadors, on their return from Rome, to pass on to Carthage unmolested. About this time (it was the autumn of the year 203 B.C.) Hannibal arrived in Africa, and soon collected an army in numbers far exceeding that of Scipio. He first made a successful campaign against Massinissa. Scipio was at this time informed that the consul Tib. Claudius Nero would come with an army to Africa to co-operate with him against Hannibal. Scipio, who wished to bring the war to a conclusion, and was unwilling to share this glory with any one else, determined to bring Hannibal to a decisive battle. The Carthaginian at first avoided an engagement; but when Scipio, in order to deceive the enemy, hastily retreated as if he intended to take to flight, Hannibal followed him with his cavalry, and lost a battle in the neighbourhood of Zama. A tribune of Scipio soon afterwards cut off a large convoy of provisions which was on its way to the camp of Hannibal, and this suddenly threw him into such difficulties, that he began to negotiate with Scipio for peace. The conditions however which Scipio now proposed were so humiliating, that the Carthaginians would not accept them. Hannibal therefore, though he saw the impossibility of gaining any further advantages, was compelled to decide the affair by a last and desperate effort. In a personal interview between the two generals Scipio was inexorable as to the conditions. Hannibal's army was in a bad condition; and in the ensuing battle, to the west of Zama, the victory of Scipio was complete. This defeat (in 202 B.C.) was the death-blow to Carthage. The conditions of the peace which was now concluded between Rome and Carthage are stated in Punic Wars, p. 129.

Scipio, on his return to Italy, was received with the greatest enthusiasm: he entered Rome in triumph, and was henceforward distinguished by the name of Africanus. Scipio now for several years continued to live at Rome, apparently without taking any part in public affairs. In 199 B.C. he obtained the office of censor with P. Ælius Pætus (Liv., xxxii. 7), and in 194 B.C. he was made consul a second time with Tib. Sempronius Longus (Liv., xxxiv. 42), and princeps senatus, a distinction with which he had already been honoured in 196 B.C., and which was conferred upon him for the third time in 190 B.C. (Liv. xxxiv. 44; xxxviii. 28.) In 193 B.C., during one of the disputes between the Carthaginians and Massinissa, Scipio was sent with two other commissioners to mediate between the parties. But nothing was settled, though, as Livy (xxxiv. 62) observes, Scipio might easily have put an end to the disputes. It is well known that Scipio was the only Roman who thought it unworthy of the republic to support those Carthaginians who persecuted Hannibal; and there was a tradition that Scipio, in 193 B.C., was sent on an embassy to Antiochus, and that he met Hannibal in his exile, who in the conversation which took place declared Scipio the greatest of all generals. (Liv., xxxv. 14.) Whether the story of the conversation be true or not, the judgment ascribed to Hannibal is certainly just, for Scipio as a general was second to none but Hannibal himself. In the year 190 B.C. some discussions arose in the senate as to what provinces should be assigned to the two consuls, Lælius, and L. Cornelius Scipio, brother of the great Africanus. Africanus, although he was princeps senatus, offered to accompany his brother as legate, if the senate would give him Greece as his province, for this province conferred upon Lucius the command in the war against Antiochus. The offer was accepted, and the two brothers set out for Greece, and thence for Asia. Africanus took his son with him on this expedition; but by some unlucky chance the boy was taken prisoner, and sent to Antiochus. The king offered to restore him to freedom, and to give a considerable sum of money, if the father would interpose his influence to obtain favourable terms for the king. Africanus refused; but the king notwithstanding soon after sent the boy back to his father, who just then was suffering from illness, and was absent from the camp. To show his gratitude, Africanus sent a message to Antiochus, advising him not to engage in a battle until he himself had returned to the Roman camp. After the great battle near Mount Sipylus, Antiochus again applied to Scipio for peace, and the latter now used his influence with his brother Lucius and the council of war on behalf of the king. The conditions of the peace were tolerably mild, but they were afterwards made much more severe when the peace was ratified at Rome. [Antiochus.] The enemies of Africanus at Rome had now another charge against him. The peace with Antiochus, and the conditions proposed by Africanus and his brother Lucius, were regarded by the hostile party as the result of bribes from Antiochus, and of the liberation of the son of Africanus. A charge was therefore brought against the two brothers, on their return to Rome, of having accepted bribes of the king, and of having retained a part of the treasures which they ought to have delivered up to the aerarium. At the same time they were called upon to give an account of the sums of money they had taken from Antiochus. Lucius was ready to obey; but his brother Africanus with indignation snatched the accounts from the hands of his brother and tore them to pieces before the senate. (Liv. xxxviii. 55; Gellius, iv. 18; Val. Max., iii. 7, 1.) The tribune of the people, C. Minucius Augurinus, however fined Lucius; and when he was going to be thrown into prison until he should pay the heavy fine, Africanus dragged him away; and the tribune Tib. Gracchus, though disapproving of the violence of Africanus, liberated Lucius from imprisonment. (Gellius, vii. 19; Liv., xxxviii. 56.) Africanus himself was now summoned before the people by the tribune M. Nævius, and he only saved himself by reminding the people of his victory at Zama. After these troubles he withdrew to his villa near Liternum, and it was owing to the interposition of Tib. Gracchus that he was not compelled to obey another summons. The estates of his brother Lucius however were confiscated (187 B.C.); but the sum produced by their sale did not make up the amount of the fine. His friends and clients not only offered to make up the sum, but their generosity would even have made him richer than he had been before; but he refused to accept anything beyond what was absolutely necessary for his support. (Liv., xxxviii. 60.) Africanus never returned from his voluntary exile, and he spent the last years of his life in quiet retirement at his villa. (Senec., *Epist.*, 86.) He is said to have wished to be buried on his estate; but there was, as Livy says, a tradition that he died at Rome, and was buried in the tomb of his family near the Porta Capena, where statues of him, his brother Lucius, and their friend Q. Ennius, were erected. The year of his death is not quite certain; for according to Polybius he died in the same year with Hannibal and Philopœmen (183 B.C.); according to others, two years earlier (185 B.C.). In judging of Scipio Africanus as a general, we may adopt the judgment ascribed to Hannibal; but as a Roman citizen he is very far from deserving such praise. His pride and haughtiness were intolerable; and the laws of the constitution were set at nought whenever they opposed his own views and passions. As a statesman he scarcely did anything worth mentioning. By his wife Æmilia, daughter of Æmilius Paullus, he had two daughters: one of whom married P. Cornelius Scipio Nasica Corculum (Liv. xxxviii. 57); the other, the celebrated Cornelia, married Tib. Sempronius Gracchus, and was the mother of the two Gracchi, the tribunes of the people. Africanus had also two sons.

12. P. Cornelius Scipio, son of the great Scipio Africanus (No. 11). He was augur in 180 B.C. (Liv., xl. 42.) Cicero (*Brut.*, 19; *De Senect.*, 11; *De Off.*, i. 33) says that he was a man of great mental powers, but of a weakly constitution. He was the adoptive father of P. Cornelius Scipio Aemilianus Africanus Minor. His epitaph is given by Orelli (*Onomast. Tull.*, p. 187).

13. Lucius or Cneius Scipio, the second son of Scipio Africanus Major (No. 11). He was, as we have seen, taken prisoner in the war with Antiochus; he is described as a contemptible man. In 174 B.C. he became prætor urbanus, by the modest withdrawal of his competitor, who had been a scribe to his father, but he was in this same year expelled from the senate by the censors. (Liv., xli. 27; Val. Max., iii. 5, 1.)

14. L. Cornelius Scipio Asiaticus, Asiagenes, or Asiagenus, son of P. Cornelius Scipio (No. 9), and brother of the great Scipio Africanus (No. 11). He accompanied, as we have seen, his brother Africanus on his campaigns in Spain. In 193 B.C. he was prætor in Sicily. In 190 B.C. he was made consul with Lælius, and obtained Greece as his province, with the command in the war against Antiochus, with whom he had already had some negotiations in 196 B.C. (Polyb., xviii. 33.) The senate at Rome does not appear to have had any great confidence in his talents as a general (Cic., *Phil.*, xi. 7), as it was only owing to the offer of his great brother to accompany him as his legate that he obtained Greece as his province. After the conclusion of the war with Antiochus, he assumed the name of Asiaticus,

and entered Rome in triumph. (Liv., xxxvii. 58, &c.) According to Valerius Antias (Liv. xxxix. 22) he celebrated, in 185 B.C., magnificent games for ten days. The money expended on these games he is said to have collected in Asia, during an embassy, on which he had been sent to settle some disputes between Antiochus and Eumenes, shortly after his condemnation. In 184 B.C. he was a candidate for the censorship, but he was defeated by his competitor Cato, the great enemy of his family, who in his censorship took away from Scipio Asiaticus his horse. (Liv., xxxix. 44.)

15. **P. CORNELIUS SCIPIO AEMILIANUS AFRICANUS MINOR**, son of L. Aemilius Paullus, and adopted son of P. Cornelius Scipio (No. 12). He must have been born about 185 B.C., for in 168 B.C. Scipio, then a youth in his seventeenth year, took a very active part in the battle of Pydna, in which his father defeated king Perseus of Macedonia. (Liv., xliv. 44; Plut., *Aem. Paul.*, 22.) From his earliest youth he had an ardent love of intellectual occupations, and cultivated the friendship of men like Polybius, Panaetius, Laelius, and others. It was perhaps on this account that he appeared to his relatives to be wanting in youthful vigour, and no great hopes were entertained of him. But with his partiality for science and Greek refinement and art, he esteemed no less the stern virtues of the best of the Romans. Old Cato was in this respect his model. At the beginning of the third Punic war, 151 B.C., when no one was willing to enter his name either as an officer or as a common soldier for the campaign in Spain, Scipio, although he was at this same time requested by the Macedonians to settle some disputes among themselves, came forward and declared that he would gladly accept any post that might be assigned to him. This example inspired with courage even those who had hitherto kept back. (Liv., *Epit.*, 48; Polyb., xxxv. 4.) Scipio thus became military tribune under L. Lucullus. Two heroic deeds of Scipio in this expedition are recorded: he was the only Roman who ventured to accept the challenge of a huge Spanish chief, whom he slew in single combat; Scipio also was the first to scale the walls of the town of Intercatia while it was besieged by the Romans. These proofs of personal courage, and his other virtues, filled even the enemy with admiration, and gained for him a greater influence over the Spaniards than his avaricious general, Lucullus, was able to acquire. (Appian, vi. 54.) The year following, 150 B.C., Scipio was sent by Lucullus to Africa, to request Massinissa to send a number of elephants over to Spain. Scipio was most honourably received. Massinissa and the Carthaginians were just preparing for battle; Scipio beheld the contest from an eminence, and as soon as the Carthaginians were apprised of his presence, they entreated him to act as mediator between them and Massinissa. But he was not able to effect what they wished, and he returned to Spain with the elephants. (Appian, viii., 71, &c.) When the war between Carthage and Rome broke out, Scipio, then still military tribune, went to Africa, and here again distinguished himself so much by his courage, prudence, and justice, that he not only gained the unlimited confidence of his own countrymen and Massinissa, but even of the Carthaginians, who trusted no Roman but Scipio. Roman ambassadors who were sent to the camp in Africa to report on the state of affairs, on their return to Rome were unbounded in their praise of Scipio and of the attachment of the soldiers to him. (Appian, viii. 98, &c.) In 148 B.C., when the consul Calpurnius Piso undertook the command in Africa, Scipio returned to Rome, where everybody appears to have been convinced that he alone was able to complete the conquest of Carthage. Cato said that Scipio alone was alive, while all the other generals were mere shadows. (Liv., *Epit.*, 49; Polyb., xxxvi. 6.) The consul Piso made very little progress in Africa, and when Scipio was a candidate for the aedileship, he was unanimously elected consul for the year 147 B.C., though he had not yet attained the legitimate age: he obtained Africa as his province. On his return to Africa he was accompanied by Polybius and Laelius, and immediately after his arrival he saved a considerable body of Roman soldiers, who had penetrated into one of the suburbs of Carthage. (Appian, viii. 113, &c.) He restored discipline in the Roman army. His first operation was to cut off all supplies which the Carthaginians had hitherto received from the interior of Africa, and in the following winter (147-46 B.C.) he succeeded in taking Nepheris, whence the Carthaginians till then had received their supplies by sea. His command of the army was prolonged for the year 146 B.C., and in the spring of this year he made his attack on the city, which was defended with the utmost despair, and by a decree of the senate he razed the city to the ground. [CARTHAGE.] He is said to have wept over its ruins, and to have uttered the prophetic words of Homer:—

> ἔσσεται ἦμαρ, ὅτ' ἄν ποτ' ὀλώλῃ Ἴλιος ἱρή,
> καὶ Πρίαμος καὶ λαὸς ἐϋμμελίω Πριάμοιο.
>
> (*Iliad*, vi. 448, &c.)

After he had made the necessary arrangements in Africa, and annihilated an enemy who, though humbled, was still looked upon by Rome with jealousy, Scipio returned to Italy, and entered Rome in triumph. In 142 B.C. he was censor with L. Mummius, and at this time of increasing luxury he fulfilled the duties of his office with the greatest strictness, and without any respect to person or rank. In the lustrum which he performed at the close of his census, he did not pray, as had been customary before, for the increase of the republic, but only for its preservation. (Val. Max., iv. 1, 10.) It was probably after his censorship that he, together with Sp. Mummius and L. Metellus, travelled through Egypt, Syria, Asia, and Greece, to look into the state of affairs in these countries. (Cic., *De Rep.*. vi. 11; comp. *Acad.*, ii. 2.) The war against Numantia in Spain had been carried on for a long time without success; Scipio was considered the only man who could bring the war to a termination, and, although absent at the time of the elections, he was made consul for the year 134 B.C. On his arrival in Spain he found the Roman army in a most deplorable state, and here, as in Africa, he had to restore military discipline before he could venture upon any enterprise. The brave inhabitants of Numantia held out against him until famine rendered further resistance impossible. The town fell into the hands of Scipio, after most of the citizens had put an end to their own lives. Fifty of the survivors were selected by Scipio to adorn his triumph; the rest were sold as slaves, and the city was razed to the ground. (Appian, vi. 84, &c.; Liv., *Epit.*, 57, 59.) While he was engaged in the siege of Numantia, the Gracchian disturbances began at Rome. Although his wife Sempronia was a sister of the Gracchi, Scipio approved of his brother-in-law being put to death, but still he was not, like many others, an obstinate advocate of the privileges of a class, for we find him supporting the lex Cassia tabellaria against the aristocrats (Cic., *Brut.*, 25), whence he was considered by some as a man of the people. (Cic., *Acad.*, ii. 5.) Scipio was opposed to all violent measures; caution was one of his prominent characteristics. He was certainly sincere and disinterested. But his opposition to the popular party deprived him of a great part of the favour and influence which he had hitherto possessed through the people. The consequence was, that when, in 131 B.C., he was inclined to undertake the command in the war against Aristonicus, he only obtained the votes of two tribes. (Cic., *Phil.*, xi. 8.) But notwithstanding this slight, he still possessed great influence, for when the tribune Papirius Carbo proposed a law that the people should be at liberty to re-elect their tribunes as often as they pleased, the eloquent speech of Scipio induced the people to reject the measure, though it was in their own favour. (Cic., *Lael.*, 25.) Soon after this however a circumstance occurred which called forth the bitterest opposition of the popular party against him. Scipio had made a proposal in favour of the old Italian veterans, which had been approved by the senate, and according to which the disputes arising out of the distribution of the public land should not be decided by the distributors, but by other persons. This measure produced a delay in the distribution itself, and the popular leaders, F. Flaccus, C. Gracchus, and Papirius Carbo, made the bitterest invectives against Scipio in the assembly, and called him the enemy of the people. When Scipio repeated his approval of the death of Gracchus, the demagogues cried out, 'Down with the tyrant!'

After these fierce debates Scipio went quietly home accompanied by the senate and a great number of Latins and Roman allies. (Cic., *Lael.*, 3.) In the evening he went into his bedroom with the intention of writing a speech to be delivered the following morning. But in the morning Scipio was found dead in his bed (129 B.C.). (Appian, *Civil.*, i. 19, &c.) An investigation into the cause of his death was prevented by the multitude, and the event remained a secret. Public opinion pointed out many who were suspected of having murdered him, and the heaviest suspicion fell upon Carbo. (Comp. Dr. Fr. Gerlach, *Der Tod des P.*

Cornelius Scipio Æmilianus, eine Historische Untersuchung, Basel, 1839; and Zimmermann, *Zeitschrift für die Alterthumswissenschaft*, 1841, No. 52.)

16. L. Cornelius Scipio, son of L. Cornelius Scipio Asiaticus (No. 14). He was quæstor in 167 B.C. (Liv., xlv. 44; Val. Max., v. 1, 1; comp. Pighius, *Annal. ad An.* 591.)

17. L. Cornelius Scipio, son of L. Cornelius Scipio (No. 16). According to Pighius he was quæstor in 96 B.C., ædilis curulis in 92 B.C., and prætor in 89 and 88 B.C. In 83 B.C. he was consul with C. Junius Norbanus, and marched against Sulla, but he was suddenly abandoned by his whole army, which had been worked upon by the agents of Sulla. Scipio was taken prisoner with his son Lucius. He was then indeed let go, but in 82 B.C. he was sent into exile, and spent the remainder of his life at Massilia. (Appian, *Civil.*, i. 82, &c.; Liv., *Epit.*, 85; Cic., *Pro Sext.*, 3; *Ad Att.*, ix. 15.) Cicero (*Brut.*, 47) says of him, 'dicebat non imperite.'

18. P. Cornelius Scipio Nasica, son of Cn. Cornelius Scipio Calvus (No. 10). In the year 203 B.C., when yet a young man, and even before he had been quæstor, he was declared by the senate to be the best of all good citizens, and commissioned to go with the Roman matrons to Ostia to receive the statue of the Idæan Mother, which had been brought from Pessinus. (Liv., xxix. 14.) In 200 B.C. he was one of the triumvirs to complete the number of colonists in Venusia. (Liv., xxxi. 49.) In 196 B.C. he was curule ædile (Liv., xxxiii. 25); in 194 B.C. he was prætor (Liv., xxxiv. 42), and the year following proprætor in Spain (Liv., xxxv. 1), where he fought several successful battles to the west of the Iberus. In 192 B.C. he was a candidate for the consulship, but he was not elected, notwithstanding his success in Spain, and notwithstanding the support of his cousin the great Africanus. (Liv., xxxv. 10.) But the following year he was more successful; he became consul with M. Acilius Glabrio (Liv., xxxv. 24), and gained a signal victory and a triumph over the Boians. (Liv., xxxvi. 38.) When L. Scipio Asiaticus was accused, Nasica came forward as his advocate. (Liv., xxxviii. 58.) In 184 B.C. he was a candidate for the censorship, but M. Porcius Cato was preferred to him. (Liv., xxxix. 40.) In 183 and 182 B.C. he was one of the triumvirs to establish a Latin colony at Aquileia. (Liv., xxxix. 55; xl. 34.) In 171 B.C. Spanish ambassadors came to Rome to complain of the extortions of their Roman governors, and when the senate granted them the privilege of chosing patrons to conduct their cause at Rome, Scipio Nasica was one of the patrons. (Liv., xliii. 2; compare Cic., *De Orat.*, iii. 33.)

19. P. Cornelius Scipio Nasica Corculum, son of P. Corn. Scipio Nasica (No. 18). He was married to a daughter of Scipio Africanus Major, and distinguished himself in the campaign of Aemilius Paullus in Macedonia. (Liv., xliv. 35, &c.; Polyb., xxix. 6.) In 162 B.C. he was consul, but only for a short time, for he and his colleague were obliged to abdicate, because a mistake had been made in the auguries for the election. (Cic., *De Nat. Deor.*, ii. 4; *De Div.*, ii. 35.) In 159 B.C. he was censor with C. Popillius Lænas, and they made a decree, that only the statues of those men should remain standing in the Forum who had held a magistracy, and that all the others should be removed. (Plin., *Hist. Nat.*, xxxiv. 14; Aurel. Vict., *De Vir. Illustr.*, 44.) Scipio in his censorship introduced at Rome the use of a public clepsydra, and built a portico on the Capitol. In his second consulship, 155 B.C., he gained a victory over the Dalmatians, and took the town of Delminium. (Liv., *Epit.*, 47; Aurel. Vict., *l. c.*) During this year there occurred a proof of the stern severity of his character, and of his influence: at his proposal the senate ordered a theatre to be pulled down, the erecting of which had been approved by the censors, and which was very near its completion. Scipio thought a theatre injurious to the morals of the Romans. (Liv., *Epit.*, 48.) When Cato insisted upon the destruction of Carthage, Scipio Corculum opposed him on the ground that the existence of such a rival as Carthage was most wholesome to Rome itself, as a check against corruption. (Plut., *Cat. Maj.*, 27.) In 150 B.C. he became pontifex maximus. Respecting his talents as an orator and his studies, see Cic., *Brut.*, 20, and *De Senect.*, 14.

20. P. Cornelius Scipio Nasica Serapio, son of P. Cornelius Scipio Nasica Corculum (No. 19). Before the outbreak of the third Punic war he was quæstor, and commissioned, with the consuls Censorinus and Manilius (149 B.C.), to demand from the Carthaginians the delivery of their arms to the Romans. (Appian, viii. 80.) His suit for the ædileship was unsuccessful. (Cic., *Pro Planc.*, 21; Val. Max., vii. 5, 2, in which passage however he is confounded with P. Corn. Scip. Nasica (No. 18.) In 138 B.C. he was consul with D. Junius Brutus Gallaicus. These two consuls were thrown into prison by the tribunes of the people, because they were too severe in raising soldiers for their armies. (Liv., *Ep.*, 55; Cic., *De Legg.*, iii. 9.) The chief enemy of Scipio among the tribunes was Curiatius, and it is he who is said to have given him the nickname Serapio. Scipio was a man of vehement and irascible temper (Cic., *Brut.*, 28), and of inflexible aristocratic principles. His hatred of the measures of Tib. Gracchus was so great, that during the election of the tribunes he placed himself at the head of his party in their attack upon Gracchus in the Capitol. This enraged the people so much against him, that the senate thought it advisable to send him on an embassy to Asia, although as pontifex maximus he was not allowed to quit Italy. He died at Pergamus soon after his arrival in Asia. (Plut., *Tib. Gracch.*, 21; Cic., *Pro Flacc.*, 31.)

21. P. Cornelius Scipio Nasica, son of P. Cornel. Scipio Nasica Serapio (No. 20). He was consul in 111 B.C. with L. Calpurnius Piso Bestia, who went out against Jugurtha, while Scipio remained in Italy. (Sallust, *Jug.* 27.) He is described as a man who was inaccessible to bribes, and throughout his life behaved in the most exemplary manner. (Diodor., *Fragm.*, xxxiv., p. 214, ed. Tauchnitz.) He died during his consulship. (Cic., *Brut.*, 34.) Cicero says that in wit and humour he excelled everybody.

22. P. Cornelius Scipio Nasica, son of P. Cornel. Scipio Nasica (No. 21). He was prætor in 94 B.C. He is mentioned by Cicero (*Pro Rosc. Am.*, 27) as one of the advocati of Roscius of Ameria. His wife was Licinia, the daughter of the orator L. Crassus. (Cic., *Brut.*, 58.) He was the father of L. Licinius Crassus Scipio, whom Crassus the orator made his adoptive son, and of Q. Metellus Pius Scipio, who was adopted by Q. Metellus Pius, and was father-in-law of Pompey. Metellus Scipio was defeated by Cæsar, and fell in Africa.

23. Cn. Cornelius Scipio Hispallus, the son of a brother of the two Scipios who fell in Spain (No. 9 and 10). He was consul in 176 B.C., but during his consulship he was seized with a paralytic stroke, and died at the baths of Cumæ. (Liv., xli. 20.)

24. Cn. Cornelius Scipio Hispallus, son of Cn. Corn. Scipio Hispallus (No. 23). In 149 B.C. he was with Scipio Nasica (No. 20) among the commissioners to Carthage. (Appian, viii. 80.) In 139 B.C. he was prætor, and promulgated an edict according to which all Chaldæans (astrologers) were to quit Rome, and Italy within ten days. (Val. Max., i. 3, 2, who calls him Caius Corn. Hispallus.)

25. Cn. Cornelius Scipio Hispallus, son of Cn. Corn. Scipio Hispallus (No. 24). He is mentioned only by Valerius Maximus (vi. 3, 3), who says that he was compelled to give up his province of Spain, to which he had been sent as quæstor, on account of his inability, and that afterwards he was condemned for dishonest conduct.

26. L. Cornelius Scipio Hispallus, son of Cn. Corn. Scipio Hispallus (No. 24). Pighius (*Annal. ad An.* 646) thinks that he is the same of whom Appian (*Civil.*, i. 41) says that in the Marsian war he and L. Acilius were compelled to escape from Æsernia in the attire of slaves.

For the history of the family of the Scipios compare Orelli, *Onomasticon Tullianum*, p. 183, &c.; Pauly, *Real-Encyclopædie der Alterthumswissenschaft*, vol. ii., p. 656, &c.

The family tomb of the Scipios was first discovered in 1616, but it was soon forgotten, as few of its ruins had been laid open, and doubts were raised as to its genuineness. In 1780 the tomb was again discovered close by the modern gate of S. Sebastian. Visconti and the pope took great interest in the discovery, and in the course of a year the whole catacomb, though in a dilapidated state, was cleared and laid open. The inscriptions and other curiosities, among which we may mention the beautiful sarcophagus of Scipio Barbatus, were transferred to the Museum Pio-Clementinum at Rome. The monuments with their inscriptions are described in *Monumenti degli Scipioni, publicati dal Cavaliere Francesco Piranesi*, Roma, 1785, fol.; and in Lanzi, *Saggio*, vol. i., p. 150, &c. For the inscriptions see Orelli, *Inscript. Lat.*, n. 550-559.

SCIRE FA'CIAS, a writ sued out for the purpose either of enforcing the execution of, or of vacating, some already existing record. It directs the sheriff to give notice ('Scire facias,' whence the name) to the party against whom it is obtained to appear and show cause why the purpose of it shall not be effected. A summons to this effect should be served on the party, whose duty then is to enter an appearance, after which a declaration is delivered to him, reciting the writ of scire facias. To this he may plead, or demur, and the subsequent proceedings are analogous to, and in fact are in law considered as an action. If the party cannot be summoned, or fail to appear, judgment may be signed against him. The proceedings under a scire facias are resorted to in a variety of cases. They may be divided into

1. Those where, the parties remaining the same, a scire facias is necessary to revive or set in operation the record.

2. Those where another party seeks to benefit, or becomes chargeable, or is injured, by it.

In cases where a year and a day have elapsed since judgment has been signed, and nothing (such as a writ of error, an injunction, &c.) has existed to stay further proceedings, it is a legal presumption that the judgment has either been executed, or that the plaintiff has released the execution. Accordingly in such case execution cannot issue against the defendant until he has had an opportunity, by means of the notice given him under a scire facias, of appearing and showing any cause which may exist why execution should not issue against him. If the plaintiff attempt to take out execution in such a case without having recourse to a scire facias, the execution may be set aside by a writ of error, or upon application to the court, or before a judge. If the judgment has been signed more than ten years, a scire facias itself cannot issue unless with the permission of the court or a judge; and it would seem that by the recent statute 3 and 4 William IV., c. 27, s. 40, proceedings are limited to a period of twenty years.

Upon a verdict for the plaintiff in debt on an instrument under seal, by which the defendant is bound in a penal sum for the performance of any acts, the jury assess the amount of damages actually incurred by the breach of performance which is the subject of the existing action. The judgment nevertheless is entered for the whole penalty, but execution is taken out for the amount only of the damages assessed. The judgment still remains as a security to the plaintiff in case any further breaches are committed. If further breaches are committed, the plaintiff sues out a scire facias to put the judgment again in force for the purpose of obtaining the further compensation which has become due to him. Where parties have entered into a recognizance [Recognizance], and either the conusor or conusee die within a year, or execution is not taken out within a year after the day of payment assigned by it, a scire facias must be sued out in order to have execution upon it. By 3 and 4 William IV., c. 42, s. 3, the scire facias must be brought some time within twenty years from the time when the party became liable. Where the plaintiff, having had execution by elegit, under which he obtains possession of a moiety of the rents and profits of the defendant's land, has had the debt satisfied by payment or from the profits of the land, scire facias may be brought to recover the land.

2. The cases of more ordinary occurrence under the second head are those where one of the parties to an action becomes bankrupt, or insolvent, or dies, or, being a female, marries, or where it is sought to enforce the rights of a plaintiff against the bail to an action, or to set aside letters patent. If a plaintiff become bankrupt after interlocutory and before final judgment, his assignees should sue out a scire facias to make themselves parties to it and have execution. If the bankruptcy occurs pending a writ of error brought by the defendant, the assignees should affirm the judgment in his name, and then sue out a scire facias. The same course is to be adopted in the case of insolvency. If either party to an action die between the verdict and judgment, the judgment may, by 17 Charles II., c. 8, be entered as if no such death had occurred, provided the entry be made within two terms; and the effect will therefore be the same as if the death had occurred after final judgment, and before execution. In such case a scire facias must be brought by or against those who, in the capacity of executors, &c., represent the deceased party. Where the death occurs between interlocutory and final judgment, the action does not abate, but a scire facias is necessary to revive it. Where a judge has sealed a bill of exceptions and dies, a scire facias must be brought against his executors to certify it. If a woman obtain a judgment, and marry before execution, the husband and wife must sue out a scire facias to have execution. And if judgment is obtained against a woman, and she marries before execution, a scire facias must be brought against her and her husband before execution can be obtained. The object of the recognizance into which the bail to an action enter, is to secure to the plaintiff the payment of the damages and costs to which the defendant may become liable, or his surrender as a prisoner. If the plaintiff obtain a verdict, and the defendant fail to perform either of these conditions, the plaintiff may proceed by scire facias against the bail. To this the bail may plead that he has given time to the defendant without their concurrence or any other fact by which their liability is discharged. A scire facias is the only proceeding available for the purpose of repealing letters patent by which the king has made a grant injurious to some party, as where he has granted the same thing which he had already granted to another person; or a new market or fair is granted to the prejudice of an antient one, &c. The king may have a scire facias to repeal his own grant, and any subject who is injured by it may petition the king to use his name for its repeal. Scire facias lies to recover the money from a sheriff who has levied under a fieri facias and retains the proceeds. (2 Wms. Saund., 71; Tidd's *Practice;* Archbold's *Practice.*)

SCIRRHUS. [Cancer.]

SCISSURELLA. [Turbinacea.]

SCITAMI'NACEÆ. [Zingiberaceæ.]

SCIU'RIDÆ. [Squirrels.]

SCLAVONIC, SCLAVONIANS. [Slavonic.]

SCLERANTHA'CEÆ, a small natural order of plants placed by Lindley in the curvembryose group of incomplete Exogens. They are small herbs with opposite leaves without stipules, having axillary sessile flowers, which are hermaphrodite. The calyx is 4-5 toothed, with an urceolate tube; stamens 1-10; ovary simple, superior, 1-seeded; styles 2 or 1; fruit a membranous utricle, which is surrounded by the hardened calyx; seeds pendulous; embryo cylindrical, lying curved round farinaceous albumen. They are mostly natives of barren fields in Europe, Asia, and North America. The plants of this order are nearly related to Chenopodiaceæ, but from these they differ in the indurated tube of the calyx, from the orifice of which the stamens proceed, and also in the number of the stamens, which often exceeds that of the divisions of the calyx. The Scleranthus perennis was formerly used in medicine. The Polish or German cochineal is obtained from the roots of this plant.

SCLERO'TICA. [Eye.]

SCLERO'TICUM. [Ergot.]

SCO'LIA (from σκολιός, crooked) were short drinking-songs, which were invented and cultivated by the antient Greeks. The origin of the name 'crooked songs' has been explained by the antients themselves in a variety of ways, of which we shall mention only two. Some supposed that these songs were called scolia because they were not sung by the guests in succession, and in the order in which they lay on their couches, but irregularly, and without any definite order: others thought that the name referred to peculiarities in their metrical forms; or, which is the most probable of all, to certain liberties which the singer might take in delivering his song. The first of these two opinions, though not a probable account of the origin of the name scolion, yet contains the true account of the manner in which scolia were sung. Artemon (*Ap. Athen.*, xv., p. 694) and Plutarch (*Sympos.*, p. 615) distinguish three kinds of scolia, viz. those which were sung in a chorus by a whole company, those which were sung by all the guests in succession, and those which were only sung by persons well skilled in the thing, who, when they ceased, called upon another member of the company to go on. But the name scolion seems, in the first two of these cases, to be applied improperly, as they must rather be considered as a kind of prelude to the real scolia, which is in fact implied in the description given by Plutarch (*l. c.*). These drinking songs were generally accompanied by the lyre, which was handed by the last singer to his successor: in some cases however, when persons were unable to play the lyre, a laurel or myrtle branch was handed to them. Scolia were first sung and composed by the Greeks of the Æolian race, and especially in Lesbos; but the custom was thence transferred into Attica, where it subsequently became a universal practice to sing scolia at repasts. The contents of these short songs, which, in the specimens still extant, seldom exceed four lines, varied according to time and circumstances; but it was a rule that only beautiful scolia should be sung, that is, such as contained some useful maxim or some ethical idea. (Artemon, *l. c.*) The metres in which scolia were written are of a lively and animated character, and, on the whole, resemble those used by the lyric poets of the Æolian school. Terpander is said to have been the first who wrote scolia, and he was followed by Alcæus, Sappho, Anacreon, Praxilla, Simonides, Pindar, and many others. A collection of Greek scolia still extant has been made by C. D. Ilgen, in his *Σκολιά, i.e.* 'Carmina convivialia Græcorum, metris suis restituta et animadversionibus illustrata,' Jena, 1798. The number of scolia in this collection is fifty, but they are not all real scolia.

(Compare Müller, *Hist. of Greek Lit.*, i., p. 188, &c.; Bode, *Geschichte der Hellenischen Dichtkunst*, vol. ii., part 2, p. 456, &c.)

SCO'LIADÆ, a family of Fossorial Hymenopterous Insects, distinguished by the following characters combined: antennæ thick in the females, shorter than the head and thorax; femora bent near the apex, and compressed; legs short and stout, and densely clothed with spiny hairs. The thorax is often short, and produced on each side.

The family *Scoliadæ* is thus subdivided by Latreille:—

I. Palpi always very short. Ligula with three linear divisions. Abdomen of the male terminated by three spines. Stigma replaced by a small cell. *Scolia.*

II. Maxillary palpi generally elongated. Ligula broad and expanded at the apex; a recurved spine at the apex of the abdomen in the males. Stigma distinct.

A. Second joint of the antennæ exposed; two complete cubital cells, or sometimes three, in which case the central cell is small and petiolated.

a. Without incomplete cubital cell closed by the posterior border of the wing. Radial cell either wanting or open in the females. *Tiphia*, Fab., and *Meria*, Illiger.

b. With an incomplete cubital cell closed by the posterior margin of the wing. *Tengyra*, Latr.

B. Second joint of the antennæ enclosed in the basal joint. Cubital cells four in number, of which the last is completed by the posterior margin of the wing in the males; none of them petiolated. *Myzine*, Latr.

SCOLOPA'CIDÆ. The place assigned to this family by modern systematists will be found in the article GRALLATORES.

The genus *Scolopax* of Linnæus consisted of the following species:—*Guarauna, Madagascariensis, Arquata, Phæopus, fusca, Rusticola, Gallinago, Gallinula, Fedoa, Glottis, Calidris, Totanus, Limosa, Capensis, Lapponica, Ægocephala, alba*, and *candida*. (*Syst. Nat.*, ed. xii.)

According to Cuvier, this genus comprehends the following subgenera:—*Scolopax, Ibis, Numenius, Rhynchæa, Limosa, Calidris* (Cuv. *Tringa*, Temm.), *Arenaria** (Bechst., *Calidris*, Vig.), *Pelidna, Falcinellus, Machetes, Eurynorhynchus, Phalaropus, Strepsilas, Totanus, Lobipes*, and HIMANTOPUS. (*Règne Animal*, ed. 1829.)

Mr. Vigors traces out the distinction between the family *Scolopacidæ* and the *Ardeïdæ* in the weakness and elevation of the hinder toe, and the slenderness and flexibility of the bill. The latter character is, he observes, more particularly conspicuous in the typical species which make use of the flexible bill in penetrating the mud and soft spungy marshes whence they extract the worms, insects, smaller mollusks, and animalcules that chiefly constitute their food. The family is, in his opinion, united to the *Ardeïdæ* by means of *Numenius*, Briss., which approaches *Ibis* most closely in its bill. By means also of the immediate connection of *Ibis* with the genera *Eurypyga* and *Aramus*, the *Scolopacidæ* preserve their affinity to those groups, with which, indeed, their appearance has generally associated them. This, he remarks, may be inferred from the generic or specific name originally conferred upon each of these groups, the former genus being formed of the *Scolopax helias* of Pallas, or the *Caurale Snipe* of Latham's 'Synopsis,' and the latter of the *Ardea Scolopacea* of Linnæus. 'We cannot,' says Mr. Vigors in continuation, 'have a more accurate guide through the affinities of this extensive family than M. Temminck, whose opportunities of observing the habits and characters of the birds of the present order have been so extensive, and whose abilities have been so fully exerted, as to leave little room for further observation on the subject, as far at least as regards the European species. Following his views, with some slight modification, we may remark, that from *Numenius* we pass on to *Totanus*, Briss., the bill of which, comparatively robust at the point, holds a middle situation between the strong bill of that genus and the entirely flexible bill of *Limosa*, Briss. The genus *Recurvirostra* of Linnæus appears to come naturally among these groups, and to be intermediate between *Totanus* and *Limosa;* with the former of these it is connected by the structure of the foot, the *Totanus semipalmatus* of M. Temminck almost immediately meeting it; while with some species of the latter it is equally associated by the turned-up bill. The latter genus, *Limosa*, unites itself to the true *Scolopax*, Auct., by the flexible nature of its bill, a character which prevails through the remaining groups of the family. *Scolopax* leads to *Tringa*, Linn., through the medium of *Rhynchæa*, Cuv., which approaches the whole of the latter genus by its shorter bill, and agrees in particular with some species of it which have that member feebly curved, by the slight curvature observable at the extremity of its own. Among the groups which originally composed the *Tringa* of Linnæus, the *Phalaropus* of M. Brisson may be distinguished, which, by its lobated feet and habits of swimming, stands at the extremity of the present groups, and leads the way to the succeeding family of *Rallidæ*. The present family is united at its extremes, and the circular succession of affinities between its various groups is preserved, by means of some species of *Tringa*, whose curved bills lead back to *Numenius*, from which we started. The *Tringa platyrhyncha* of M. Temminck, the same as the *Numenius pygmæus* of the *Index Ornithologicus*, completes the circle.' (*On the Natural Affinities that Connect the Orders and Families of Birds*, in *Linn. Trans.*, vol. xiv.)

Mr. Swainson makes the *Scolopacidæ* consist of the following genera and subgenera:—*Eurypygia*, Ill.; *Scolopax*, Linn. (with the subgenera *Rhynchæa, Scolopax, Limosa, Phalaropus*, and *Tringa*); *Himantopus* (with the subgenera *Recurvirostra, Himantopus, Totanus, Machetes*, and *Falcinellus*); *Strepsilas*, Ill.; and *Numenius*, Briss. (*Classification of Birds*, vol. ii.)

The Prince of Canino arranges the following genera under the family *Scolopacidæ*:—*Numenius*, Lath.; *Eurynorhynchus*, Nils.; *Tringa* (Bonap., *Calidris*, Cuv.); *Pelidna*, Cuv.; *Calidris*, Ill.; *Falcinellus*, Cuv.; *Machetes*, Cuv.; *Actitis*, Boié, not Ill.; *Actiturus*, Bonap.; *Totanus*, Bechst.; *Catoptrophorus*, Bonap.; *Glottis*, Nils.; *Terekia*, Bonap.; *Limosa*, Briss.

Under the second subfamily, *Scolopacinæ*, the Prince comprises the following genera:—*Macroramphus*, Leach; *Gallinago*, Steph.; *Rusticola*, Vieill.; *Scolopax*, Bonap. (*Birds of Europe and North America.*)

Mr. G. R. Gray divides the *Scolopacidæ* into the following subfamilies and genera:—

I. *Numeninæ.—Numenius*, Ray; *Limosa*, Briss.; *Terekia*, Bonap.; *Erolia*, Vieill.; *Ibidorhyncha*, Vig.

II. *Totaninæ.—Totanus*, Ray; *Glottis*, Nils.; *Guinetta*, Briss.; *Actiturus*, Bonap.; *Catoptrophorus*, Bonap.

III. *Recurvirostrinæ.—Recurvirostra*, Linn.; *Cladorhynchus*, Gray; *Himantopus*, Briss.

IV. *Tringinæ.—Hemipalama*, Bonap.; *Heteropoda*, Bonap.; *Tringa*, Linn.; *Machetes*, Cuv.; *Pelidna*, Cuv.; ? (Cocorli, Cuv.); *Eurynorhynchus*, Nils.; *Ereunetes*, Ill.; *Calidris*, Ill.

V. *Scolopacinæ.—Macroramphus*, Leach; *Rhynchæa*, Cuv.; *Scolopax*, Linn.; *Rusticola*, Vieill.; *Scolopax*, Linn.; *Rusticola*, Vieill.; *Homoptilura*, Gray; *Telmatias*, Boie; *Gallinago*, Ray.

VI. *Strepsilinæ.—Strepsilas*, Ill.

VII. *Phalaropodinæ.—Steganopus*, Vieill.; *Phalaropus*, Briss.; *Lobipes*, Cuv.

Of these genera, *Eurynorhynchus* had been previously used in ornithology, and *Heteropoda* had been preoccupied for a division of mollusks. [GASTEROPODA, vol. xi., p. 92.]

We now proceed to lay before our readers some of the forms of this extensive group, and shall endeavour to illustrate such of the others as require especial notice under their proper titles.

Scolopax.

Generic Character.—Bill long, straight, compressed, soft, the point enlarged; the two mandibles furrowed for half their length; point of the upper mandible longer than the lower, the enlarged end forming a blunt hook; *arête* elevated at the base, projecting. Nostrils lateral, basal, slit longitudinally near the borders of the mandible, and covered by a membrane. Feet moderate, slender, naked space above the knee very small; three toes before entirely divided, the external and middle toe united; a hind toe. Wings moderate, 1st quill rather shorter than, or of the same length as, the 2nd, which is the longest. (Temm.)

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* Used in botany.

M. Temminck divides the genus into three sections.

Section 1.

Tibia feathered to the knee.

Example, *Scolopax Rusticola.*

Description.—Male.—Upper parts varied with ruddy, yellowish, and ash, and marked by great black spots; lower parts yellowish-red, with brown zigzags; quills striped with red and black on their external barbs; tail-feathers terminated above with grey and below with white. Feet livid. Length about 13 inches.

Female.—Rather stouter and larger, but her colours are less vivid, and the wing-coverts have many white spots.

Accidental Varieties.—Yellowish-white or yellowish-red, with the spots of the plumage of a pale tint: the plumage often irregularly sprinkled with white spots: sometimes the wings and tail are pure white; more rarely the whole of the plumage is perfect white.

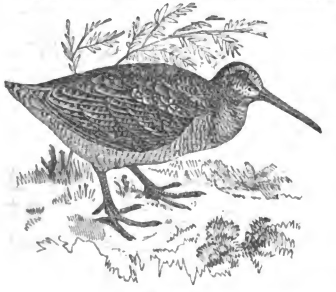
M. Temminck, who enumerates these varieties, adds as a variety, according to climate or the places inhabited by the bird, *Scolopax Rusticola parva*, which is smaller than ordinary individuals, and has all the colours of the plumage of a deeper tint, a greater number of black spots and dots on the upper parts, the lower parts clouded with ash, and the feet lead-coloured.

In the fourth part of his *Manuel* however, lately published (1840), he states that these *little Woodcocks* are, according to his observations, the young of late hatches, or of pairs whose nest has been robbed of their first deposit; these, he says, do not commence their migration till many weeks after the masses of woodcocks, which quit the northern countries early in October, when the late hatches are not yet strong enough to undertake the passage.

M. Temminck adds, that the most sure way of distinguishing the sexes had been recently communicated to him by M. Verster de Wulverhorst. The *males* have the external edge of the barbs of the first quill covered with brown spots upon a yellowish-white ground; the *females* have a spotless white edging throughout the length of those barbs.

This is the *Bécasse* of the French; *Beccaccia* of the Italians; *Waldschnepfe* of the Germans; *Holt Sneppe* of the Danes; *Morkulla* of the Swedes; *Blom-Rokke, Rutle*, and *Krogquist* of the Norwegians; *Cyffylog* of the antient British; and *Woodcock* of the modern British.

It is most probably the σκολόπαξ (*Scolopax*) of Aristotle.



Scolopax Rusticola.

Geographical Distribution.—Very wide. The species is found in Western Lapland beyond the Arctic Circle, in Finland, Russia, Siberia, rarely in Germany, and more rarely in France. A few have been known to breed in Switzerland. It is noted by the Prince of Canino as very common in Italy, and has been found all the year through at Madeira. Barbary possesses it, and at Athens it is by no means uncommon. They have been seen abundantly in Smyrna, and have been found in Aleppo and Egypt. It has been noticed in Cashmere and at Japan; in which last locality it is subject to the same varieties as with us.

Food, Habits, &c.—Worms, small snails or slugs, and (according to Temminck) small beetles form the food of the Woodcock; but earthworms appear to be its favourite nourishment. For these it bores with its long and sensitive bill with unerring certainty. The Woodcock breeds occasionally, not to say frequently, in this country, in Scotland especially. The nest is placed on the ground in a dry warm spot among herbage, and is loosely fabricated of dead leaves, of the common fern principally, and unlined. The eggs, three or four in number, are pale yellowish-white, blotched, and spotted at the larger end with ash-grey, and two shades of reddish-yellow brown, according to Yarrell; of a dirty-yellow sprinkled with small spots of pale brown, according to Temminck. When surprised, the old birds have been known to carry off their young in their bills and claws.

We need hardly add that the bird, served with its trail in, is a delicious dish.

II. Section.

Lower part of the tibia denuded of feathers.

Snipe.

III. Section.

External and middle toe united by a very small membrane.

Macroramphus, Leach.

Example, *Macroramphus griseus, Scolopax grisea*, Auct.; *Brown Snipe* of Pennant.

Strepsilas, Ill.

Generic Character.—Bill moderate, hard at the point, strong, straight, of an elongated conical shape, slightly curved upwards; *arête* flattened; point straight, truncated. Nostrils basal, lateral, long, half closed by a membrane, pierced through and through. Feet moderate; not much nakedness above the knee; three toes before and one behind; the three anterior toes united at the base by a very short membrane; the posterior toe articulated upon the tarsus. *Wings* acuminate; the first quill the longest. (Temm.

Example, *Strepsilas collaris.*

Description.—Very old Male.—Front, space between the bill and the eye, a large collar on the nape, a part of the back, a longitudinal band and another transversal one upon the wing, upper coverts of the tail, middle of the breast, as well as the other lower parts, all of pure white; deep-black takes the shape of a narrow frontal band, which, passing before the eyes, is dilated below, where on one side it is directed on the lower jaw, and on the other dilating itself anew on the sides of the neck, it surrounds the throat, and forms a wide plastron in front of the neck and on the sides of the breast; top of the head reddish-white, striped longitudinally with black; upper part of the back, scapulars, and coverts of the wing bright chesnut red, sprinkled irregularly with large black spots; a large brown band on the rump; lateral quill of the tail pure white; bill and iris black; feet orange-yellow. Length 8 inches and 2 or 3 lines.

Female.—Differs only in having the shades less pure and the black less deep.

In this state of plumage the bird is *Tringa Interpres* of Gmelin; *Morinella collaris*, Meyer; *Turnstone* or *Sea Dotterel* of Edwards.

Young of the Year.—No trace of black nor of red chesnut. Head and nape of ashy-brown striped with deep-brown; white spots on the sides of the head and neck; throat and front of the neck whitish; feathers of the sides of the breast deep brown, terminated with whitish; the other lower parts and the back pure white; upper part of the back, scapulars, and coverts of the wings deep brown; all the feathers surrounded by a wide yellowish border; transverse band of the rump deep brown bordered with ruddy; feet yellowish-red. The black and white more regularly defined, in proportion as the bird advances in age.

In this plumage the bird is *Tringa Morinella*, Linn.; *Tringa Interpres Morinella*, Gmel.; *Arenaria cinerea*, Briss.; *The Turnstone* of Pennant.

Young at the age of a Year.—The large plastron, or collar on the front of the neck and on the sides of the breast, is marked out with black feathers, terminated by a narrow whitish border; summit of the head and nape brown, spotted with blackish-brown; back, scapulars, and coverts of the wings black, all the feathers surrounded by a ruddy border; a great black spot on the lateral tail-feather; the rest as in the adults. (Temm.)

This is the *Voltapietre* of Savi; *Steinwälzer* of Brehm; and *Huttan y môr* of the antient British.

Geographical Distribution.—Very wide. Nova Zembla. Greenland, Winter Island, Felix Harbour, the coast between Victoria Harbour and Fury Point—about the middle and end of June. Shores of Hudson's Bay and of the Arctic Sea up to the seventy-fifth parallel, where it breeds in June, quitting in September, halting in October on the shores of the Delaware, and proceeding farther south on the setting in of cold weather. The United States. The straits of Magellan. Cape of Good Hope. Japan, Sunda, the Molucca Islands, and New Guinea. New Holland. In Europe, from Russia southward to Italy. Norway. Madeira. In this country it is found on the coasts from August to May, when it returns northward to breed. Stationary in Zetland, according to Dr. Fleming, who concludes that it breeds there.

Food, Habits, &c.—The *Turnstone*, as its name implies, procures its food—small crustaceans, molluscous animals, &c.—by turning over the stones on the shore which shelter its prey with its strong bill. Mr. Hewitson found its nest on the coast of Norway placed against a ledge of rock, and consisting of nothing more than the dropping leaves of the juniper bush, under a creeping branch of which the eggs, four in number, of an olive-green colour, spotted, and streaked with ash-blue and two shades of reddish-brown, were concealed and sheltered.

Strepsilas collaris.

Totanus.

Generic Character.—Bill moderate, straight, sometimes slightly recurved, firm, rounded, the upper mandible grooved and with its tip curving over the lower mandible. Nostrils lateral, basal, linear, longitudinally cleft in the furrow of the mandible. Legs long, slender, naked above the knee. Toes three before, united at the base by a small membrane, and one behind, which is short. Wings moderate.

Such is the character of those *Scolopacidæ* which are termed by the English *Redshanks*, *Greenshanks*, &c., and by the French *Chevaliers*.

Example, *Totanus stagnatilis.*

Description.—Male and Female in perfect Winter Plumage.—Bill very weak, long, and awl-shaped; on the external barbs of the caudal feathers are two zigzagged bands, disposed longitudinally; feet very long, greenish. Eyebrows, face, throat, middle of the back, front of the neck and breast, as well as the other lower parts, of pure white; nape striped longitudinally with brown and white; top of the head, upper part of the back, scapulars, and great coverts of the wings clear ash bordered with whitish; smaller coverts and bend of the wing blackish ash; sides of the neck and breast whitish with small brown spots; tail white striped diagonally with brown bands, except on the two external feathers, which have a longitudinal zigzag band; bill ashy-black; feet olive-green; iris brown. Length about nine inches.

Young before the First Moult.—Different from the adults and young in winter, in having the feathers of the upper part of the back, scapulars, and coverts of the wings blackish-brown, all surrounded by a large yellowish border; the largest feathers which extend upon the quills have small diagonal rays of very deep brown; on the face and sides of the head are some very small brown points; extremity of the quills whitish; feet greenish-ash.

In this state the bird is *Scolopax Totanus*, Linn.; *Le petit Chevalier aux pieds verts* of Cuvier; *La Barge grise* of Buffon.

Summer or Nuptial Plumage.—White from the upper part of the bill to the eye; throat, front of the breast, belly, and abdomen pure white; space between the eye and the bill, temples, sides and front of the neck, sides of the breast, and lower coverts of the tail equally pure white, but on each feather a small longitudinal black spot; top of the head and nape striped longitudinally with black on a greyish white ground; top of the back, scapulars, and great coverts of ash tinged with reddish, each feather varied with transverse black bands, the largest of which is towards the end; the black bands are diagonal on the longest scapulars; the two quills of the middle of the tail are ash, striped diagonally; the others striped on the external barbs in longitudinal zigzags; feet greenish; bill black.

In this plumage it is *Totanus stagnatilis* of Leisler, and *Albastrella cenerina* of the *Stor. degl. Ucc.*

Geographical Distribution.—North of Europe, on the borders of rivers, migrates along the eastern provinces of Europe to the Mediterranean, but never along the maritime coasts of the ocean. (Temm.) M. Temminck adds, in his fourth part, that the winter plumage of the individuals of the isles of Sunda, Timor, and New Guinea is rather paler than in those killed in Europe; in the young there is no difference; in their nuptial plumage they are never received from those islands. M. Temminck states also that the species inhabits the eastern parts of Europe. It had never been sent to him from Japan.

Totanus stagnatilis.

Machetes.

Generic Character.—Bill straight, rather slender, with a smooth and dilated tip. Nostrils basal, lateral, linear, situated in the commencement of the groove. Wings long and sharp-pointed; first and second quills equal, and longest. Legs long, slender, and naked high above the tarsal joint. Three anterior toes, one posterior, which is short; outer toe connected to the middle toe by a membrane as far as the first joint.

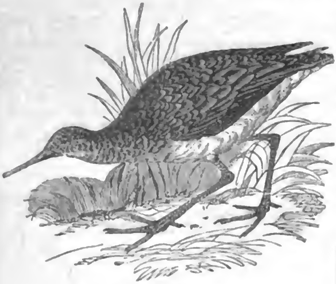
Example, *Machetes pugnax.*

Description.—Tail rounded, the two middle feathers striped; the three lateral feathers always uniform in colour. The hues of the plumage so variable, that it is almost impossible to find two individuals which perfectly resemble each other.

Plumage of Autumn and Winter.—Male.—Face covered with feathers; occiput and neck clothed with short plumage; throat, front of the neck, belly, and the other lower parts pure white; breast reddish, with brown spots; plumage of the upper parts most frequently brown, sprinkled with black spots, and bordered with reddish; the longest wing-coverts and the middle tail-feathers striped with brown, black, and red; bill brownish; feet yellowish, tinged with greenish brown or reddish; iris brown. Length nearly twelve inches.

Female.—A third smaller, her plumage more ashy, and the front of the neck rarely of a pure white; bill black; feet of a deeper hue.

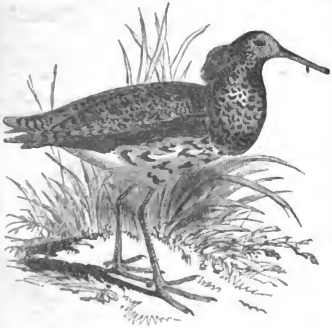
The male in this state is the *Tringa variegata* of Brunnich.



Male Ruff in Winter Plumage.

Summer or Nuptial Plumage.—*Male.*—Face naked, covered with tubercles or fleshy warts. The occiput is adorned with long feathers; a large ruff, composed of beautiful feathers, adorns the throat; these feathers and those of the occiput contrast ordinarily with the colours spread over the plumage of the body, which is most frequently variegated with red, ash-colour, black, brown, white, and yellowish; the feathers of the ruff and occiput vary infinitely; bill yellowish orange; warts yellow or reddish. Feathers of the ruff more or less long according to the age of the bird.

In this state the male is the *Tringa pugnax* of Linnæus.



Male Ruff in his Summer dress.

The Young of the Year much resemble the females in winter plumage, but the tints of the front of the neck and breast are dead reddish-ash. The feathers of the head, back, scapulars, and great coverts of the wings are blackish brown, with wide red and yellowish borders; the lesser coverts of the wings are bordered with reddish white; throat, belly, and abdomen pure white; bill black; feet greenish.

In this state the bird is *Tringa littorea* of Linnæus; *Le Chevalier varié* of Buffon; *Shore Sandpiper* and *Greenwich Sandpiper* of Latham.

The adult female and the young after the autumnal moult are the *Tringa equestris*, *Equestrian Sandpiper* of Latham; *Le Chevalier commun* of Buffon; and *Le Chevalier ordinaire* of Gérard. (Temm.)

This species is *Le Combattant* and *Paon de Mer* of the French; *Salsarola* and *Uccello muto* of the Italians; *Bruushane* of the Danes; *Brushane* of the Swedes; *Streitschnepfe* and *Rampfhähnlein* of the Germans; *Ruff* (male), *Reeve* (female), of the modern British; and *Yr Ymladdgar* of the antient British.

Geographical Distribution.—Iceland, Lapland, Scandinavia, Denmark, Siberia, Russia, France, Provence, Switzerland, Italy, Malta, Tunis, Trebizond, and the neighbourhood of the Caucasus. In Ireland the Ruff appears occasionally in spring and autumn. (Thompson.) In England it arrives in spring, about April, and departs in autumn.

Food, Habits, &c.—The food of the Ruff consists of worms and such insects as it can pick up in moist and marshy places; in the spring it is rarely found on the shores of the sea. Colonel Montagu has given the best account known to us of the habits of the Ruff, and of the mode of taking it and fattening it for the table:—

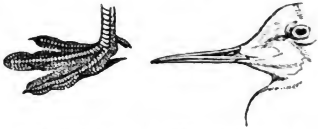
'The trade of catching ruffs,' says that distinguished ornithologist, 'is confined to very few persons, and at present scarcely repays their trouble and expense of nets. These people live in obscure places, on the verge of the fens, and are found out with difficulty; for few if any birds are ever bought but by those who make a trade of fattening them for the table; and they sedulously conceal the abode of the fowlers; so much so, that by no art could we obtain from any of them where they resided; and in order to deceive us, after evading our entreaties, they gave us instructions that led us in quite a contrary direction. The reason of all this was obvious; for after much labour and search, in the most obscure places (for neither the innkeepers nor other inhabitants of the towns could give any information, and many did not know such a bird was peculiar to their fens), we found out a very civil and intelligent fowler, who resided close to Spalding, at Fengate, by name William Burton (we feel pleasure in recording his name, not only from his obliging nature, but for the use of others in similar pursuits), and strange to say, that although this man had constantly sold ruffs to Mr. Towns, a noted feeder, hereafter more particularly noticed, as also to another feeder at Cowbit, by the name of Weeks, neither of those persons could be induced to inform us even of the name of this fowler. The reason however was evident, and justly remarked by Burton, for he obtained no more than ten shillings per dozen, whereas Weeks demanded thirty shillings for the like number he had the same day bought of Burton. The season was far advanced, and we were obliged to buy some at that price of Weeks, for Burton could not then catch us as many as were required. At this time we were shown into a room where there were about seven dozen males and a dozen females, and of the former there were not two alike. This intrusion to choose our birds drove them from their stands, and, compelling some to trespass upon the premises of others, produced many battles. By this feeder we learned that two guineas a dozen was now the price for fattened ruffs; and he never remembered the price under thirty shillings, when fit for table. Mr. Towns, the noted feeder at Spalding, assured us his family had been a hundred years in the trade, and boasted that they had served George II. and many noble families in the kingdom. He undertook, at the desire of the late marquis of Townsend, when that nobleman was lord-lieutenant of Ireland, to take some ruffs to that country, and actually set off with twenty-seven dozen from Lincolnshire; left seven dozen at the duke of Devonshire's, at Chatsworth, continued his route across the kingdom to Holyhead, and delivered seventeen dozen alive in Dublin, having lost only three dozen in so long a journey, confined and greatly crowded as they were in baskets, which were carried upon two horses. Nothing can more strongly evince the hardy constitution of these birds than the performance of such a journey, so soon after capture, and necessarily fed with a food wholly new to them. Yet a certain degree of care and attention is requisite to preserve, and more especially to fatten them; for out of the seventeen dozen delivered at the castle of Dublin, not more than two dozen were served up to table, doubtless entirely owing to a want of knowledge or attention of the feeder under whose care they had been placed. The manner of taking these birds is somewhat different in the two seasons; in the spring the ruffs *hill*, as it is termed, that is, they assemble upon a rising spot of ground, contiguous to where the reeves propose to deposit their eggs; there they take their stand, at a small distance from each other, and contend for the females,—the nature of polygamous birds. This hill, or place of resort for love and battle, is sought for by the fowler, who, from habit, discovers it by the birds having trodden the turf somewhat bare, though not in a circle, as usually described. When a hill has been discovered, the fowler repairs to the spot before the break of day, spreads his net, places his decoy birds, and takes his stand at the distance of about 140 yards, or more, according to the shyness of the birds. The net is what is termed a single clap-net, about seventeen feet in length, and six wide, with a pole at each end; this, by means of uprights fixed in the ground, and each furnished with a pulley, is easily pulled over the birds within reach, and rarely fails taking all within its grasp; but in order to give the pull the greatest velocity, the net is (if circumstances will permit) placed so as to fold over with the wind; however there are some fowlers who prefer pulling it against the wind for plovers. As the ruffs feed chiefly by night, they repair to their frequented hill at the dawn of day, nearly all at the same time, and the fowler makes his first pull according to circumstances, takes out his birds, and prepares for the stragglers who traverse the fens and have no adopted hill; these are caught singly, being enticed by the stuffed birds. Burton, who was before mentioned, never used anything but stuffed skins, executed in a very rude manner; but some fowlers keep the first ruffs they catch for decoy birds; these have a string of about two feet long tied above the knee, and fastened down to the ground. The stuffed skins are sometimes so managed as to be moveable by means of a long string, so that a jerk represents a jump (a motion very common among ruffs, who at the sight of a wanderer flying by will leap and flirt a yard off the ground); by that means inducing those on wing to come and alight by him. The stuffed birds are prepared by filling the skin with a whisp of straw tied together, the legs having been first cut off, and the skin afterwards sewed along the breast and belly, but with no great attention to cover the straw beneath; into this straw a stick is thrust, to fix it into the ground, and a peg is also thrust through the top of the head, and down the neck into the stuffing or straw body, and the wings are closed by the same process. Rough as this preparation is, and as unlike a living bird as skin and feathers can be made it answers all the purpose. When the reeves begin to lay, both these and the ruffs are least shy, and so easily caught, that a fowler assured us he could with certainty take every bird on the fen in the season. The females continue this boldness, and their temerity increases as they become broody; on the contrary, we found the males at that time could not be approached within the distance of musket-shot. We were astonished to observe the property that these fowlers have acquired of distinguishing so small an object as a ruff at such an immense distance, which, amongst a number of tufts or tumps, could not by us be distinguished from one of those inequalities; but their eyes had been in long practice of looking for the one object. The autumnal catching is usually about Michaelmas, at which time few old males are taken, from which an opinion has been formed that they migrate before the females and young. It is however more probable that the few which are left after the spring fowling, like other polygamous birds, keep in parties separate from the female and her brood till the return of spring. That some old ruffs are occasionally taken in the autumnal fowling, we have the assertion of experienced fowlers, but we must admit that others declare none are taken at this season. It must however be recollected that in the autumn the characteristic long feathers have been discharged, and consequently young and old males have equally their plain dress; but the person who assured us that old male birds were sometimes taken at that season, declared it was easy to distinguish them from the young of that summer.'

The males arrive in England several days before the females. According to Col. Montagu, the reeves begin laying their eggs the first or second week in May, and he found their nests with young as early as the 3rd of June. By that time the males ceased to *hill*. The nest was usually placed upon a tump in the most swampy places, surrounded by coarse grass, of which it was also formed. The same author describes the eggs as four in number, nearly similar in colour to those of the snipe and redshank, both of which breed in the same wet places, and make similar nests The eggs of the ruff are however, he observes, superior in size to those of the snipe; and are known from those of the redshank by the ground being of a greenish hue instead of rufous-white; but individuals assimilate so nearly to each other as not to be distinguished, especially as the dusky and brown spots and blotches are similar.

The food offered to the ruffs in captivity, and they will go greedily to it and fight for it immediately after their capture, is bread and milk or boiled wheat.

Phalaropus.

Generic Character.—Bill long, slender, weak, straight, depressed at its base, the two mandibles furrowed up to the point; extremity of the upper mandible curved over the lower one, obtuse; point of the lower mandible awl-shaped. Nostrils basal, lateral, oval, prominent, surrounded with a membrane. Feet moderate, slender, tarsi compressed; three toes before and one behind; the anterior toes united up to the first joint, the rest of them furnished with festooned or lobated membranes dentilated on the edges; hind toe without a membrane, articulated on the inner side. Wings moderate, first and second quills longest. (Temm.)



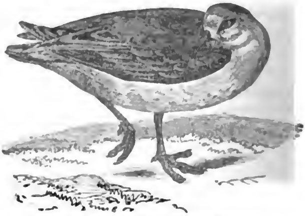
Bill and Foot of Red-necked Phalarope (Phalaropus hyperboreus).

Example, *Phalaropus platyrhynchus*.

Description.—Bill wide, depressed, flattened at the base; tail long, very much rounded.

Male and Female in Winter Plumage.—Top of the head, occiput, and nape, pure ash-colour; a large spot of ashy-black on the orifice of the ears, two bands of the same colour take their origin towards the eyes, and pass upon the occiput, where they form a single band, which descends the whole length of the nape; lateral parts of the breast, back, scapulars, and rump, very pure bluish ash; blackish occupies the centre of all these feathers, and is directed along the shafts; the longest of the scapulars terminated with white; a transversal white band on the wing; tail-feathers brown, bordered with ash-colour; front, sides of the neck, middle of the breast, and all the other lower parts, pure white; bill yellowish-red at its base, brown towards the point; iris reddish-yellow; feet greenish ash. Length above eight inches.

In this state the bird is *Phalaropus lobatus* of Latham; *Tringa lobata* of Linnæus; *Phalarope à festons dentelés* of Buffon; *Le Phalarope gris* of Cuvier; and *Grey Coot footed Tringa* of Edwards.

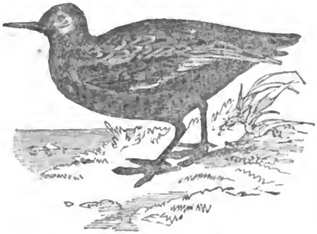


Phalaropus Platyrhynchus in Winter Plumage.

Young before the Moult.—A blackish spot of a horse-shoe shape on the occiput, and a band of that colour passing upon the eyes; nape, back, scapulars, upper coverts, and quill-feathers of the tail, ashy-brown; feathers of the back, scapulars, and middle tail-feathers, with wide yellowish borders; rump white, varied with brown; secondaries and quills edged with white, the coverts bordered and terminated with yellowish-white; a transverse white band upon the wing; front, throat, sides and front of the neck, breast and other lower parts, of greenish-yellow; bill ashy-brown.

In this state it is the *Grey Phalarope* of Latham.

Summer or Nuptial Plumage.—Old Male and Female.—Head, nape, back, scapulars, and upper coverts of the tail, blackish-brown; all the feathers of these parts are surrounded by a wide red-orange border; a yellowish band passes above the eyes; wing-coverts blackish, terminated with white, a transverse white band on the wing; rump white, spotted with black; front of the neck, breast, belly, abdomen, and lower tail-coverts, brick-red.



Phalaropus Platyrhynchus in Summer Plumage.

In this plumage it is *Tringa Fulicaria* of Brunnich; *Phalaropus rufus* of Bechstein: *Tringa hyperborea* of Linnæus: *Le Phalarope rouge* of Buffon and Cuvier; *Phalarope roussâtre* of Brisson; *Red Coot-footed Tringa* of Edwards.

M. Temminck adds that individuals in summer plumage which have not attained the age of two or three years have the belly more or less variegated with white feathers.

In his lately published fourth part he describes the female in summer plumage as having the forehead, the top of the head, and the occiput of a full spotless black; the band on the cheeks wider than in the male, and of pure white; black predominates on the plumage of the back, the red borders of the feathers being narrower than in the male; the lower parts are less red, and less mingled with white feathers. This plumage the female keeps longer than the male, which moults some time after the female, and loses his summer dress before she does.

This bird is the *Grey Phalarope* of the modern British; and *Pibydd llwyd llydandroed* of the antient British.

Geographical Distribution.—Within the Arctic Circle; the eastern parts of the North of Europe; abundant in Siberia, on the shores of great lakes and rivers; migratory on the great lakes of Asia and on the Caspian Sea; numerous in America; migratory, but at uncertain intervals, throughout most of the countries of Europe; rare in Switzerland, on the lake of Geneva; with us it is a winter visitor. It appears to be spread generally from the northern towards the intertropical regions.

Food, Habits, &c.—Insects or crustaceans principally, which live on the surface of the water, form the principal food of the *Grey Phalarope*, and it rarely seeks for its nourishment on the banks or on land. M. Temminck refers to Major Sabine's memoir 'On the Birds of Greenland,' where that acute observer relates that on the 10th of June, and at the 68th degree of latitude (where the species breeds), a number of these birds were seen swimming at sea in the middle of icebergs, and at a distance of four thousand miles from land; and M. Temminck observes that he cannot see why this bird, with such habits and such a form as it has, should be associated with the *Snipes* and *Chevaliers*.

Mr. Gould (*Birds of Europe*) remarks that 'the places which it not uncommonly chooses for its residence during its sojourn with us are such as would possess for it, according to our ideas, but little attraction; thus, for instance, it will often continue for weeks together, if unmolested, about a farm-yard pond or mere puddle, manifesting a familiar and unsuspecting disposition, and allowing itself to be approached with freedom; it does not however appear to confine itself much longer to one spot, but after remaining at a certain place from one to three or four weeks, suddenly departs, if on the approach of spring towards the north, and in autumn towards the south; every European country, in fact, appears to be equally visited, although at uncertain and often long intervals. Like the other species, it is an admirable swimmer, taking its food on the surface of the water with the utmost agility and address; indeed it appears to seek its nourishment there alone, and may be watched while assiduously engaged in this occupation, displaying a thousand graceful attitudes and manœuvres.'

The eggs are greenish-ash, spotted and dotted with black.

Numenius.

Generic Character.—Bill long, slender, curved, compressed, hard at the point, and subobtuse; upper mandible exceeding the lower, rounded towards the end, canaliculated for three-fourths of its length. *Nostrils* lateral, linear, pierced in the canaliculation. Face feathered, space between the eye and the bill covered with feathers. Feet slender, naked above the knee; three toes before and one behind, which last is articulated on the tarsus and touches the ground, the anterior toes united up to the first joint by a membrane. Wings moderate; first quill longest.

Example, *Numenius arquatus*.

Description.—Male.—The whole plumage bright ash-colour, with longitudinal brown spots on the head and breast, some of the feathers of those parts clouded with red; belly white, with longitudinal spots; feathers of the back and scapulars black in the middle and bordered with red; tail whitish ash, striped with brown bands disposed transversely; upper mandible blackish-brown; the lower mandible flesh-colour; iris brown; feet deep ash. Length two feet and upwards.

Female, with the tints more ash-coloured; the red which borders the feathers of the back and scapulars less pure.

Young of the Year.—Bill short, scarcely four inches long, and nearly straight; it curves in proportion as the bird grows; in old individuals it measures not unfrequently upwards of six inches.

Varieties.—The species varies more or less in the number of less large spots and stripes on the breast, and in a slight degree of greater length of the bill. These are the only differences between individuals from the great Asiatic Archipelago and those of the other parts of the antient Continent.

M. Temminck, who gives these definitions, observes that it must be borne in mind that, independent of this variety, there is found in the same latitudes a different species of Curlew (*Numenius nasicus*, Temm.), which is larger than *Numenius arquatus*, and has the bill more slender, remarkably long, and but little curved in proportion to its length. The plumage is whitish, marked with numerous black spots; the belly white; the bill brown. This species inhabits Borneo and Sumatra.

Numenius Arquatus is the *Courlis* of the French; *Ciarlotto, Ciarlotto Spadone*, and *Chiurle Maggiore* of the Italians; *Heel-spove* of the Danes; *Der Grosse Krumschnäblichte Schnepfe* and *Keilhacke* of the Germans; *Curlew* of the modern British; and *Gylfinhr* of the antient British.

Geographical Distribution.—Very wide in the Old World, (the American species is different). 'Equally diffused from the sultry portion of the torrid zone to the frozen countries of the north: the islands of the Pacific Ocean, particularly New Holland, are not devoid of its presence, and we also possess examples from China, Nepaul, &c.' (Gould, *Birds of Europe.*) Very common in Asia; the individuals sent from Pondicherry differ hardly at all from those of Europe. Extends to Japan, where it is absolutely the same. (Temminck, *Manuel.*) Dr. Andrew Smith brought individuals from South Africa.

Food, Habits, &c.—The food of this well known and wary bird, which in Scotland is called the *Whaup*, consists of earth-worms, slugs, small testaceans, and insects.

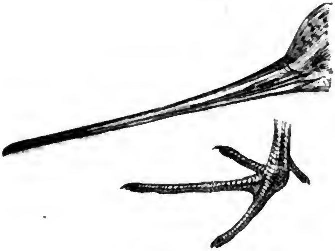
The nest, which consists of a few dry leaves, &c. carelessly put together, is placed among rushes or long grass and heath; Temminck says, often in the downs which border the sea. The egg, which is large (2 inches 7 lines long, 1 inch 11 lines broad), is olive-green, blotched, and spotted with darker green and deep brown. It breeds in these islands. The young run almost as soon as they are out of the shell, but do not fly for a long time. The clear whistle of the bird is usually uttered on the wing, but Mr. Hewitson saw a curlew perch on the top of a pine in Norway, during summer, and in that situation it uttered its cry.

The bird, at certain seasons, is not bad eating, and it formerly enjoyed a considerable reputation in that way. At the *Intronazation* of George Nevell, archbishop of York (reign of Edward IV.), one hundred were served, and they stand next to the woodcocks, of which there were four hundred. In the Northumberland *Houshold* book, *Kyrlewes* are charged at the same price as *Fesauntes* and *Bytters* (bitterns), viz. 12*d.*, whilst Woodcocks are charged at 1*d.* or 1½*d.*, and Partridges at 2*d.* In the expenses of Sir John Nevile of Chete, Knight, on the marriage of his daughter Elizabeth Nevile (17th Henry VIII.) is the following: 'Item, Curlews, 3 of a dish;' and 18 curlews are charged at 24*s*, whilst 40 partridges are only charged 6*s.* 8*d.* Among the charges of the same Knight at Lammas Assizes (20th Hen. VIII.), we find 20 curlews at 26*s.* 8*d.*, and 32 'Curlew Knaves' at 32*s.*

Numenius Arquatus.

Limosa.

Generic Character.—Bill very long, more or less curved upwards, soft and flexible throughout its length, depressed, and flattened towards the point; the two mandibles furrowed throughout their length, the point flat, dilated, and obtuse. Nostrils lateral, longitudinally slit in the furrow, pierced through and through. Feet long, slender; a great naked space above the knee; three toes before and one behind; middle toe united to the external one by a membrane which extends up to the first joint; the posterior toe articulated upon the tarsus. Wings moderate; first quill longest. (Temm.)



Head and Foot of Limosa melanura.

All known species of the *Godwits* undergo a double moult, which changes, nearly entirely, the colour of the plumage. The females are always larger than the males, and lay very large eggs in proportion to their size; and their periodical moult takes place later than that of the males, indeed after they have assumed their new dress. (Temm.)

Example, *Limosa melanura.*

Description.—Bill straight; tail uniform black, with a base of pure white; claw of the middle toe long and dentilated; a white beauty-spot (miroir) on the wings.

Old Males and Females in Winter Plumage.—All the upper parts uniform brown-ash, only varied by the deeper brown of the shafts; throat, front of the neck, breast, and sides bright grey; rump blackish; belly, abdomen, upper part of the quills, and base of the caudal feathers, pure white; on all the tail-feathers a great space of deep black, those of the middle terminated with white; bill orange at its base, and black at the point; feet blackish-brown. Length upwards of 15 inches. The colours of the female are less bright.

In this state the bird is *Limosa melanura* of Leisler; *Scolopax Limosa* of Linnæus; *Totanus Limosa* of Bechstein; *La Barge ou Barge Commune* of Buffon; *Jadreka Snipe* of Latham.

Young before their first Moult.—Band of the upper mandible to the eye, throat, base of the caudal feathers, upper part of the quills, belly, and abdomen pure white; feathers of the upper part of the head brown, bordered with bright red; neck and breast bright ashy-red; feathers of the back and scapulars blackish, surrounded by a red band; coverts of the wings ash, bordered and terminated by a great space of reddish-black; extremities of the tail-feathers bordered with white; point of the bill brown.

In this plumage the bird is *Totanus rufus* of Bechstein.

Nuptial Plumage.—Male.—Band of the upper mandible to the eye whitish-red; space between the eye and the bill brown; feathers of the top of the head black, bordered with bright red; throat and neck bright red, striped transversely with fine black zigzagged bands; upper part of the back and scapulars deep black; all these feathers terminated with a band of bright red and bordered by spots of that colour; coverts of the wings ash; lower part of the back and tail deep black; middle of the belly, abdomen, base of the tail-feathers, and upper part of the quills pure white; base of the bill bright orange; feet black.

The colours of the *females* are less bright and the black spots are less numerous in her plumage. (Temm.) Mr. Gould says they frequently surpass the male in brilliant colouring.

In this state the bird is *Scolopax Belgica*, and *Scolopax Ægocephala* of Gmelin; *Totanus Ægocephalus* of Bechstein; *La grande Barge Rousse* of Buffon; *Red Godwit* of Latham; and *Dunkelfussiger Wasserlaufer* of Meyer.

Rhostog is the autient British name for the Godwits.

Geographical Distribution.—Northwards as far as Iceland. Rare along the Rhine on its double passage, which is directed more towards the shores of the sea than along the rivers. Europe; Germany, Holland, and Switzerland. Japan and the Isles of Sunda. (Temminck.) Italy. Spain, North Africa, Trebizond, Erzeroom, and the neighbourhood of the Caucasus. Mr. Gould states that it inhabits the whole of the European continent, and that examples are found in most collections from Africa and India. With us they are most frequently seen in spring and autumn. They breed mostly in high northern latitudes, but occasionally in England. In Ireland the species is but seldom seen.

Food, Habits, &c.—The food consists of insects and their larvæ, worms, &c. The nest is formed of dry grass and herbage, and the four eggs are light olive brown, blotched and spotted with darker brown.

Godwits were formerly considered most delicious eating (*The Devil is an Ass*, iii. 3; Sir Thomas Browne and others); but though they are now sometimes fattened with bread and milk, like Ruffs, they are not held in half the estimation that Ruffs are.

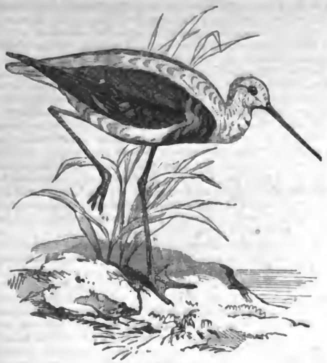
Cladorhynchus. (G. R. Gray.)

This genus, which closely approximates *Himantopus*, was first characterised by the Chevalier B. Dubus, under the name of *Leptorhynchus*. Mr. Gould published a description and part figure of the species here noticed, in his *Synopsis of the Birds of Australia*, as *Himantopus palmatus*. *Leptorhynchus* had been pre-occupied in ornithology; and therefore, as Mr. Gould observes, Mr. G. R. Gray's name must stand.

Example, *Cladorhynchus pectoralis; Leptorhynchus pectoralis*, Dubus.

Description.—Body white; breast crossed by a broad band of chesnut, bordered anteriorly with black; wings and centre of the abdomen black; bill black; legs reddish-yellow. In a specimen presumed to be the female, the band on the chest was greyish-brown instead of chesnut, and there was no appearance of the black mark on the centre of the abdomen; and in another the pectoral band was apparently disappearing, from which Mr. Gould infers that this mark only exists in the breeding season.

Localities.—Southern and Western Australia. Rottnest Island.



Cladorhynchus pectoralis.

Reduced from Mr. Gould's figure of the natural size, in his magnificent work on *The Birds of Australia*, now in the course of publication.

The *Sandpipers* will be more particularly noticed under the titles TOTANINÆ and TRINGINÆ.

SCOLOPENDRA, according to Latreille, a genus of the order *Myriapoda*, and belonging to a section of that order termed *Chilopoda*. In the classification of Dr. Leach the Myriapoda are raised to the rank of a class; and Latreille's section *Chilopoda* is regarded as an order, to which the name *Syngnatha* is applied. The species of the genus *Scolopendra*, as now restricted, are distinguished from others of the section of which they form a part, by their possessing at least twenty-one pairs of legs, and there are more segments apparent on the upper surface of the body than on the under; the antennæ are composed of seventeen joints; the eyes are distinct, and are four in number on each side. These insects inhabit the southern parts of Europe, and all the tropical portions of the globe; their mandibles (which, strictly speaking, it would appear are formed by the second pair of legs) are terminated by a sharp hook, which is pierced for the transmission of a venomous fluid. The *Scolopendræ* have the body long, slender, and depressed, and protected by coriaceous plates: they run very fast, and shun the light, living for the most part under logs of wood and the loose bark of decayed trees. Their venomous properties cause them to be much dreaded in the hot climates which they inhabit. [SYNGNATHA.]

SCO'MBRIDÆ, a family of fishes of the section *Acanthopterygii*, of which the common mackerel may be regarded as a type: the tunny, sword-fish, dory, and boar fish also belong to this group, which contains a multitude of species and many genera. The body is generally covered with small scales; the tail is usually very powerful and deeply cleft: in most of the species the pectoral fins are long, narrow, and pointed; the dorsal fins are two in number, the foremost of them being composed of bony rays; the hinder dorsal is chiefly supported by soft rays, and is often divided into numerous small false fins. They are provided with numerous cæca, and these are often united in clusters. In the genus *Scomber*, as now restricted, the body is covered with small smooth scales; the dorsal fins are widely separated; the hinder part of the second dorsal, as well as of the anal fin, is divided into numerous small spurious fins or finlets, which extend along the hinder part of the body, above and beneath, almost to the tail; the sides of the tail are carinated, and the body is elongated and tapering at both extremities. To this genus belongs the common mackerel (*Scomber Scomber* of Linnæus, or *Scomber vulgaris* according to some authors), a fish too well known to require to be described here. 'This fish,' Mr. Yarrell observes, 'it is probable inhabits almost the whole of the European seas; and the law of nature which obliges it and many others to visit the shallower waters of the shores at a particular season, appears to be one of those wise and bountiful provisions of the Creator by which not only is the species perpetuated with the greatest certainty, but a large portion of the parent animals are thus brought within the reach of man, who, but for the action of this law, would be deprived of many of those species most valuable to him as food.' It may be further observed, says the same author, that there is scarcely a month throughout the year in which the fishes of some one or more species are not brought within the reach of man by the operation of this law. 'On the coast of Ireland the mackerel is taken from the county of Kerry on the west, along the southern shore, eastward to Cork and Waterford; from thence northward to Antrim, and north-west to Londonderry and Donegal. Dr. MacCulloch says it visits some of the lochs of the Western Islands, but is not considered very abundant. On the Cornish coast, this fish in some seasons occurs as early as the month of March, and appears to be pursuing a course from west to east. They are plentiful on the Devonshire coast, and swarm in West Bay about June. On the Hampshire and Sussex coast, particularly the latter, they arrive as early as March, and sometimes even in February; and the earlier in the year the fishermen go to look for them, the farther from the shore do they seek for and find them. Duhamel says the mackerel are caught earlier at Dunkirk than at Dieppe or Havre: up our own eastern coast however the fishing is later. The fishermen of Lowestoffe and Yarmouth gain their great harvest from the mackerel in May and June. Mr. Neill says they occur in the Forth at the end of summer; and Mr. Lowe, in his "Fauna Orcadensis," states that they do not make their appearance there till the last week in July or the first week in August.'

'The most common way of fishing for mackerel, and the way in which the greatest numbers are taken, is by drift-nets. The drift-net is twenty feet deep, by one hundred and twenty feet long; well corked at the top, but without lead at the bottom. They are made of small fine twine, which is tanned of a reddish-brown colour, to preserve it from the action of the sea-water; and it is thereby rendered much more durable.'

SCONE or SCOON, a village in Perthshire, on the left or east bank of the Tay, a little above Perth, which is on the west or right bank. It was famous in the middle ages as the residence and place of coronation of the Scottish kings. The celebrated stone which for so long a time formed the seat of the Scottish kings at their coronation, was transferred hither from Dunstaffnage by Kenneth II., when he united the territories of the Picts and the Scots under his sceptre, in the ninth century. [PICTS, vol. xviii., p. 149.]

This stone remained at Scone until the invasion of Scotland by Edward I., who carried it to Westminster (A.D. 1296), where it still remains. [EDWARD I., p. 286.] The Scottish princes were however still crowned at Scone until the union of the two crowns. In the twelfth century an abbey of the regular canons of St. Augustine was founded at Scone. This abbey continued till the Reformation, when, as well as the palace, which had been the residence of the kings, it was demolished by a mob from Perth and Dundee.

The modern village of Scone is neatly and regularly built, with a population of about 1500. That of the whole parish, in 1831, was 2268, of whom about 40 men were employed in fishing on the Tay, and about the same number in stone-quarries.

SCOPAS, a celebrated sculptor, born in the island of Paros. Pliny (*Hist. Nat.*, xxxiv. 8) makes Scopas contemporary with Ageladas, Polycletus, Myron, and other distinguished artists who were living in the eighty-seventh Olympiad; but from various circumstances, it seems probable that he did not flourish till a somewhat later period. Like many artists of antiquity, he united the two professions of sculpture and architecture; and the temple of Minerva Alea, at Tegea in Arcadia, was constructed under his direction. (Pausanias, viii. 45.)

The date of the destruction of the temple which the new edifice was intended to replace, and the period at which another work on which Scopas was employed was completed, materially assist in establishing the age of this artist. Pausanias says the older temple referred to was burned during the archonship, in Athens, of Diophantus, in the second year of the ninety-sixth Olympiad (about 388 B.C.); and Pliny (xxxvi. 5) tells us that Scopas was one of the sculptors employed on the tomb erected in honour of Mausolus, king of Caria, by Artemisia, his queen, who died (before the work was completed) in the hundred and seventh Olympiad, or about 350 B.C. Scopas, it is true, may have been living at the same time with some of the later artists mentioned by Pliny, but a calculation of the above dates will sufficiently prove almost the impossibility of his practising as a contemporary artist with the great sculptors preceding and forming the Phidian age and school, and likewise exercising his art at a date so distant from their time as three hundred and fifty years before our æra. He lived, most probably, between 400 and 300 years B.C.

Pliny furnishes a copious list of works by this artist. Among those which he says were particularly worthy of admiration was a series of figures representing Neptune, Thetis, Achilles, Nereids mounted on dolphins, and attended by Tritons and other marine monsters. All these 'were from the hand of Scopas,' and Pliny adds, 'it was a splendid work (*præclarum opus*), sufficient for the fame of his whole life. It was preserved in the temple of Cneius Domitius, in the Circus Flaminius at Rome. The same writer also mentions two statues of Venus, one of Pothos, or Desire, one of Apollo, and a much admired Vesta in a sitting attitude; also a colossal sitting figure of Mars, and a Bacchus at Cnidus.

Pliny tells us there was a doubt in his time whether some statues representing the dying children of Niobe ('*Niobæ liberos morientes*') in the temple of Apollo Sosianus at Rome, were by Scopas or Praxiteles. The well known group or series of figures representing this subject, now preserved in the gallery of the grand-duke of Tuscany at Florence, is generally believed to be the work alluded to by Pliny. Whether it be an original production of either of these great masters, or, as some critics have supposed, only copied from their work, it must ever be classed among the finest specimens of art, and as a noble monument of the genius of its author. This group has been described in a former article. [NIOBE.]

Scopas was employed upon the tomb of Mausolus, and had for his associates and rivals (*æmulos eadem ætate*) Bryaxis, Timotheus, and Leochares. This work, considered by the antients one of the seven wonders of the world, was of a square form, having four faces. Each of the above-named artists completed one side. The eastern was given to Scopas; the northern to Bryaxis; the southern to Timotheus; and Leochares decorated the western façade. Pliny in mentioning this uses the terms *cælavere* and *cælavit*, from which it may be inferred that all their performances were in *rilievo*. The whole mass, measuring twenty-five cubits in height, was surmounted by a quadriga, or four-horsed chariot in marble. This was the work of one Pythis; of whom nothing further is known than his having been thus employed on this celebrated monument.

Pausanias, in his description of Greece, speaks of various performances of Scopas (both in bronze and marble), existing in the cities which he visited. In the temple of Venus at Megara were statues of Ἔρως, Ἵμερος, and Πόθος (Love, Passion, and Desire). (Paus., i. 43.) There was also a statue of Hercules by him at Sicyon (ii. 10); and at Gortys in Arcadia were two statues, one of Æsculapius, *imberbis* (or beardless), and the other of Hygeia (viii. 28). Two works by Scopas are celebrated by epigrams in the Greek Anthology: one of them refers to a much admired statue of Mercury; another pays a high compliment to the skill displayed by the sculptor in a figure of a Bacchante represented in a state of inebriety. The latter work was executed in Parian marble.

Strabo (lib. xiii., 604) mentions a statue by Scopas, of Apollo, in rather a remarkable character,—that of a *killer of rats*. It was in the temple of the god surnamed Smintheus, at Chrysa or Chryse in the Troad. The figure was represented in the act of pressing or crushing a rat with his foot.

From the terms in which Pausanias speaks of the temple before alluded to, which Scopas built to Minerva Alea at Tegea, his merit as an architect must have been little if at all inferior to that which he displayed in the sister art. Pausanias says it far exceeded, both in the quality of its decoration and its dimensions, all the other temples in Peloponnesus. He describes it as being of the Ionic order on the outside; but within it was decorated with Doric columns having over them others of the Corinthian order. In the pediment in front was represented the hunting of the Caledonian boar, with Atalanta, Meleager, Theseus, and numerous other figures. The other pediment exhibited the contest of Telephus and Achilles. Pausanias does not state distinctly that these works were by Scopas, but it may fairly be inferred that they either were executed by him or at least were produced under his superintendence.

Before closing this short notice of Scopas it may be right to mention that the difficulty of reconciling the dates given by Pliny has led the learned antiquary Sillig (*Catal. Artificum*, p. 415) to suppose there may have been two artists of the name; one a native of Paros, and the other of Elis. But the reasons adduced do not however appear sufficient to warrant such a conclusion.

SCOPAS, or SCOPINAS, an artist or mechanist, of unknown date, mentioned by Vitruvius.

SCO'POLI, GIOVANNI ANTONIO, was born at Cavalese in the Tyrol, on June 13, 1723. After pursuing his preliminary studies at Trent, he went to Innspruck, and took the degree of doctor in medicine at that university in 1743. He early displayed a great fondness for natural history, and was in a great measure self-taught, since there was not then at Innspruck any professor capable of directing his studies in that department. Botany especially attracted his attention, and he formed a plan, which however he never executed, for publishing the Flora of his native country.

A journey which he made to Vienna led to his obtaining an appointment as a physician at Idria. Here he published a Flora of Carniola, and his proximity to the quicksilver-mines gave him many opportunities for cultivating mineralogy. The results of these studies appeared in various memoirs, among which was a valuable essay on the diseases to which the miners are liable. The talent and indefatigable diligence which he displayed, excited the envy and opposition of many of the officers in the mines, but his appointment as professor of mineralogy at Idria relieved him from all the disquietudes to which he had before been subjected. On the removal of Jacquin to Vienna, Scopoli succeeded to the chair of mineralogy at Schemnitz; and in 1777 he was appointed professor of natural history at Pavia, where he died on May 8, 1788.

Scopoli was well acquainted with all branches of natural history, though especially distinguished as a botanist. He was much respected by Jacquin and Linnæus, the latter of whom named a plant in honour of him, and a genus Scopolia is still distinguished by botanists.

There is a notice of his life in the *Dictionnaire des Sciences Médicales, Biographie Médicale*, tome vii., article 'Scopoli.'

His principal works are, 'Flora Carniolica,' Vienna, 1760, 8vo., and Leipzig, 1772, 8vo.; 'Entomologia Carniolica,' Vienna, 1763; 'Tentamina Physico-chemico-medica,' Venice, 1761, 8vo., Jena, 1771, 8vo., which contains his paper on the diseases of the workers in the quicksilver-mines; 'Deliciæ Floræ et Faunæ Insubriæ,' &c., Pavia, 1786-88, three parts, folio.

SCOPS. [STRIGIDÆ.]

SCOPUS. [HERONS, vol. xii., p. 166.]

SCORE, in Music, is a collection of all the vocal and instrumental parts of a composition, arranged on staves one above the other, and bar for bar, presenting at once, to the eye of a skilful musician, the effect of the whole band as the composition proceeds.

SCORPIO, a genus of the class Arachnida, order Pulmonaria, and section Pedipalpi. The animals of this genus (commonly called scorpions) are distinguished from other groups of spiders by their having the abdomen articulated and terminated by a curved spur at the extremity; the palpi are very large, and the terminal segment assumes the form of the lobster's claw, being in like manner provided with pincers; the stigmata are eight in number, and situated along the inferior and lateral part of the abdomen; on the under side of the thorax are two comb-like appendages; the number of the eyes varies from eight to twelve in different species, and some subgenera have been established upon this character. Those to which the term *Scorpio* is used in its most restricted sense have only six eyes; those *Scorpions* which have eight eyes constitute the subgenus *Buthus*; and those which have twelve eyes, *Androctonus*.

'These Arachnides,' says Latreille, 'inhabit the hot countries of both hemispheres, live on the ground, conceal themselves under stones and other bodies, most commonly in ruins, dark and cool places, and even in houses. They run with considerable swiftness, curving the tail over the back—this they can turn in every direction, and use for the purposes of attack and defence. With their forceps they seize various insects, on which they feed after having pierced them with their sting. They are particularly fond of the eggs of spiders and insects.

The wound occasioned by the species found in the southern parts of Europe (*Scorpio Europæus*), is not usually dangerous; but according to the experiments of Dr. Maccary, made upon himself, the sting of some other and larger species produces serious and alarming symptoms, and the older the animal the more active seems to be the poison. The remedy employed is the volatile alkali, used externally and internally.

The young scorpions are produced at various intervals, and are carried by the parent for several days upon her back, during which time she never leaves her retreat.

SCO'RPIUS, or SCORPIO (the Scorpion), a constellation of the zodiac, lying between Libra and Sagittarius, and bounded north and south by Ophiuchus and Lupus. It contains one star of the first magnitude, which, with Spica Virginis, and Arcturus, forms a conspicuous triangle. As noticed in Libra, this constellation was formerly two signs of the Greek zodiac, the claws occupying the place of Libra. The story is that the chelæ or claws of the Scorpion were drawn back by Roman astronomers, and the constellation Libra added in honour of Julius Cæsar, at whose death a new star was said to have appeared in that part of the heavens. This story is alluded to, not very distinctly, by Virgil; Hyginus is totally silent about it, merely saying that his countrymen call one part of this constellation Libra; Manilius uses both Libra and Chelæ. Ptolemy does not mention Libra in his catalogue, though he does elsewhere. Dupuis contends, from its presence in the most antient Indian and Persian zodiacs, that it is in reality as antient as the rest: and indeed it is not unlikely that the Greeks may have derived their zodiac from some nation in which the term for scales was confounded with that for claws, either by a synonyme in the language itself, or by mistranslation on their part.

The following are the principal stars:—

Character. Not in Bayer ( )	No. in Catalogue of		Magnitude.	Character. Not in Bayer ( )	No. in Catalogue of		Magnitude.
	Flamsteed. (Piazzi.)	Astron. Society.			Flamsteed. (Piazzi.)	Astron. Society.	
b	1	1800	6	λ	35	2007	3
A	2	1806	5		(10)	1854	6
	3	1812	7		(19)	1726	6½
	4	1815	6	(u)	(23)	1969	5½
ρ	5	1816	4		(28)	1861	7
π	6	1818	3		(28)	1972	6½
δ	7	1823	3	(d)	(31)	1864	5½
β	8	1836	2	(p)	(36)	1866	6
ω^1	9	1837	5		(39)	1868	7
ω^2	10	1838	5		(72)	1878	7
	11	1841	6		(76)	1990	6
c^1	12	1849	6		(93)	1890	7
c^2	13	1850	6		(118)	1769	7
ν	14	1851	4		(137)	2010	5
ψ*	15	1852	5	θ	(138)	2012	5
	16	1853	6		(159)	1908	6½
χ†	17	1857	6	κ	(174)	2027	3
(n)	18	1860	7	μ^1	(189)	1919	3½
(o)	19	1871	6	(f^1)	(191)	1808	6
σ	20	1872	5	(f^2)	(192)	1810	6
α	21	1885	1	μ^2	(193)	1921	4
(i)	22	1888	5½	ι^1	(210)	2037	4½
τ	23	1900	4		(214)	1924	6½
(m)	24	1907	5½		(236)	1937	6½
	25	1911	6		(237)	1829	6
ϵ	26	1915	3	ρ	(255)	1943	6
	28	1954	6	(m)	(265)	1840	6
	29	1965	6	(k)	(268)	1947	5
	30	1968	6		(273)	1949	7
	31‡	1971	6½		(280)	1848	6
	33	1991	7	η	(302)	1960	4
υ	34	2002	4				

* Commonly called χ, from a mistake of Flamsteed's.

† Usually without a letter (see above).

‡ The same star as 33 Ophiuchi.

The mythological story of the scorpion, according to Hyginus, is that it was an animal to which the earth gave birth expressly for the purpose of destroying the hunter Orion, who had boasted that he was the master of all the animals on its surface: it is sufficient to point out, in proof of the singular inconsistency of the classical mythic constellations, that the story in Orion of that worthy's death is also told by Hyginus.

SCOT, from *sceat*, an Anglo-Saxon word originally signifying 'a part' or 'portion.' It appears also, at least in composition, to have meant any sum paid; thus, sawl-sceat, soul-scot, or soul-shot, was the name for the ecclesiastical due payable at the open grave for the benefit of the soul of the deceased. Previous to the Reform Act, 2 W. IV., c. 45, in many boroughs the payment of scot and lot constituted a qualification as a voter for a member of parliament of the borough. Those who possessed such qualification at the time of passing the Act have, under certain conditions, their rights still reserved to them.

The qualification consists in the payment of the rates which are allotted to each person as the proportion to be contributed by him. The criterion adopted for the purpose of ascertaining the scot and lot voters of a borough, is the poor-rate of the respective parishes comprised in it.

(Rogers *On Elections*.)

SCOT, REGINALD, this learned and extraordinary man was born early in the sixteenth century, in which he was the most distinguished opposer of the then almost universal belief—*witchcraft*. He was the son of an English gentleman of family, and educated at Oxford. (Wood, *Athen. Oxon.*, vol. i.) He took no degree there; but returning to Smeeth in Kent, devoted himself to study, and more particularly to the perusal of old and obscure authors; occupying his hours of relaxation in gardening. The fruits of this learned leisure were, 'A perfect platform of a Hop-garden,' and 'The Discoverie of Witchcraft,' 1584. In both of these we see the mixture of sagacity and absurdity, extensive learning and puerile paradoxes, and ostentatious quoting of Greek and Latin authors, so common to writers of that period, when the writing a book, being an event in a man's life, he seized upon that opportunity to thrust in all he knew. The following is the title of the latter work:—'Discoverie of Witchcraft, proving the common opinion of witches contracting with devils, spirits, familiars, and their power to kill, torture, and consume the bodies of men, women, and children, or other creatures, by diseases or otherwise, their flying in the air, &c., to be but imaginary, erroneous conceptions, and novelties. Wherein also the practices of witchmongers, conjurors, enchantors, soothsayers, also the delusions of astrology, alchemy, legerdemaine, and many other things are opened that have long lain hidden, though very necessary to be known for the undeceiving of judges, justices, and juries, and for the preservation of poor people;' and its boldness and humanity would alone entitle it to consideration. A striking passage in the preface is to this effect: this work is composed, that, 'first, the glory of God be not so abridged and abased as to be thrust into the hand or lips of a lewd old woman, whereby the work of the Creator should be attributed to the creature; secondly, that the religion of the Gospel may be seen to stand without such peevish trumpery; thirdly, that favour and Christian compassion be used towards these poor souls, rather than rigour and extremity.' Such a work, with such a purpose, and such a common-sense straightforwardness mingled with its humanity, could not fail of drawing down on the author's head every possible ridicule, obloquy, and confutation. To assert that the devil had no power whatever of controlling the course of nature, and that old women were not assiduous and vicarious instruments of his power, was little better than atheism! And when Scot laughed at the difficult tricks of legerdemaine, and explained how they were performed, we cannot wonder at his book being burnt by the common hangman, and at 'refuters' appearing on all sides. He was abused by Meric Casaubon, Glanvil (author of the 'Scepsis Scientifica'), and finally, King James himself, who wrote his 'Demonologie,' as he informs us, 'chiefly against the damnable opinions of Wierus and Scot; the latter of whom is not ashamed in public print to deny there can be such a thing as witchcraft.'

Scot's boldness could not at once succeed, when opposed by a reigning king and the statute law of the land. When human reason was so blinded by superstition that it was a common practice to throw a woman, suspected, into a pond, and if she escaped drowning she was burnt as a witch; it is not to be expected that common-sense could gain many converts; and yet, from its having had three editions, and being translated into French and German, it would appear to have met with great success. It is now extremely rare; as an evidence of the peculiar phases which the human mind historically exhibits, this work, as well as the superstition which it combats, merits attention. This 'solid and learned person,' as Hallam calls him, 'for such he was beyond almost all the English of that age,' died in 1599, and was buried with his ancestors in the church at Smeeth.

SCOTER, a name for one of the *Surf Ducks*, *Oidemia nigra*, Flem., *Black Duck*, or *Black Diver*. The characters of *Oidemia* are given in the article FULIGULINÆ, vol. xi., p. 7.

SCOTIA, NOVA. [NOVA SCOTIA.]

SCOTISTS. [DUNS SCOTUS.]

SCOTLAND. [GREAT BRITAIN.]

SCOTLAND. It is now admitted on all hands that we first hear of the Scots as a people inhabiting Ireland, which island they appear in the fifth century to have divided with the Hiberni or Hiberniones, the previous inhabitants, over whom however they gradually acquired so decided a superiority as to be enabled to give their name to the country, which exclusively was called Scotia from the fifth down to the tenth or eleventh century.

In the beginning of the sixth century—about the year 503, according to the common calculation—a colony of Scots from the north of Ireland emigrated to North Britain, and effected a settlement in the district now constituting the county of Argyle, to which they gave the name of Dalriada (it is said, from their leader Riada, Reada, or Reuda). Mr. Skene, in his late work entitled 'The Highlanders of Scotland, their Origin, History, and Antiquities,' 2 vols., Edin., 1837, has shown that the Dalriadic kingdom never extended beyond the branch of the sea called the Linne Loch on the north, and that its eastern boundary, called by the old writers *Drumalban*, and sometimes *Dorsum Britanniae*, was 'that chain of hills which runs from Benauler, on the north-west corner of Perthshire, to the head of Loch Long, and which to this day separates the county of Argyle from the district of Atholl and the counties of Perth and Dumbarton.' Dalriada however included both the peninsula of Cantyre and the islands of Jura and Islay.

Within these bounds the Dalriadic Scots—the 'Scoti qui Britanniam incolunt,' as they are called by Bede, writing in the early part of the eighth century—remained confined for more than three hundred years, during which the rest of the island to the north of the friths of Forth and Clyde is stated by all the oldest authorities to have formed the kingdom of the Picts, which nation however, although governed by one king, appears to have been divided into two populations, the Northern or Highland Picts, and the Lowland or Southern Picts—the Septentrionales and Australes Picti of Bede. It is remarkable that Ammianus Marcellinus describes the Picti of the latter part of the fourth century as 'in duas gentes divisi, Dicaledonas et Vecturiones.' The panegyrist Eumenius also, in his oration addressed to the emperor Constantine in 310, speaks of the 'Caledonum aliorumque Pictorum silvas et paludes.' These passages would lead to the conclusion that the Caledonians were a Pictish people,—that they were in fact merely the Northern Picts. And this is the opinion now almost universally received.

The question however still remains whether these two divisions of the Picts were the same race or two different races,—whether they spoke the same or two different languages. But the weight of evidence appears to be decidedly in favour of their identity. They seem to have lived, as we have seen, under one government. They are both designated by the common name of Picts. The antient names of places throughout the district inhabited by the Southern Picts are equally Celtic with those in the district inhabited by the Northern Picts. And in the Welsh Triads, which there is good reason to believe are as old as the sixth century, the Picts in general are uniformly designated the *Gwyddyl Ffichti*, that is, the Gaelic or Celtic Picts. Bede, it may be added, although, as we have seen, he was well acquainted with the distinction between the Northern and the Southern Picts, yet, in enumerating at the beginning of his History the different languages in which the gospel was taught in Britain, speaks of only one lingua Pictorum.

The history of the kingdom of Dalriada has been preserved in considerable detail by the Irish annalists; and from their account it appears that from nearly the commencement, in 731, of the reign of the Pictish king Angus MacFergus, who was a Southern Pict, and had forced his way to the throne in opposition to a competitor supported by the Northern Picts, the latter were in the habit of entering into confederacies with the Dalriads against their fellow-subjects of the Lowlands; so that from this date repeated wars took place between the Pictish kings and the Dalriadic Scots acting in union with the Northern Picts collected around the standard of some rival claimant of the crown. In 736 Angus appears to have effected a conquest of the whole, or at least of the greater part, of Dalriada, and there is reason to believe that a line of Pictish princes, of whom the first was one of his sons, reigned in that territory from this date till the year 819, when, by the assistance of the Northern Picts and of the Irish, the Dalriadic family recovered their ancestral dominions. (Skene, i., 50, 54.) Meanwhile we find a contest also going on, with various fortune, between the two divisions of the Picts about the succession to their crown, which appears to have been to a certain extent elective, and was acquired sometimes by a Northern, sometimes by a Southern Pict, till a great victory obtained by Constantine MacFergus, a descendant of Angus, in 789, established the superiority of the Southern Picts, and, being followed by a long reign of thirty years, enabled Constantine to introduce the principle of succession by descent, and to make the monarchy hereditary in his family. His death however coincides with the year 819, in which the Scots appear to have recovered Dalriada.

Constantine was succeeded by his brother Angus (or Ungust) II., the founder of St. Andrew's; he, in 833, by Drust, a son of Constantine; he, in 836, by Uven, or Uen, a son of Angus II., who was killed by the Danes in 839. The death of Uen probably broke the power of the Southern Picts; for although two additional Pictish kings are given in the antient lists, no other events are mentioned till in the year 843 we find the whole of North Britain united under the sceptre of Kenneth MacAlpin, originally king of the Scots of Dalriada, but thenceforth styled king of the Picts.

The authorities for this historical deduction, which, for the most part, exhibit a very remarkable concurrence with one another, are principally the following:—the Latin Life of St. Columba, by his disciple Adomnan, written in the seventh century; Bede, who finished his History in 731; Nennius, who appears to have written about 858; Tighernac, the Irish annalist, who wrote about 1088, and evidently drew his information from earlier records; the antient Erse poem commonly called the Gaelic or Albanic Duan, composed before 1093; the 'Chronicon Regum Pictorum,' published by Innes (*Critical Essay on the Inhabitants of Scotland*, 2 vols. 8vo., London, 1729) from a manuscript of the fourteenth century, which however is believed to have been transcribed in this part from another much older; the catalogue of Pictish kings published by Innes from the register of St. Andrew's, written in 1251; the catalogue in Fordun, who wrote about 1385; the succession as given by Winton, whose Chronicle was written about 1410; and another list from the year 577, published by Lynch (*Cambrensis Eversus*, fol. 1662), from an antient Irish translation of Nennius. It is quite evident that no one of these five catalogues of the Pictish kings has been transcribed from any of the others. They may be found collected in the appendix to the first volume of Pinkerton's 'Enquiry into the History of Scotland preceding the Reign of Malcolm III.,' 2 vols. 8vo, 1789, 1794, or 1814.

Among all these authorities however no one gives any details of the revolution which thus appears to have placed a new and foreign dynasty on the Pictish throne, and to have for the first time united the whole of North Britain into one monarchy. And what is still more perplexing, the writers of several contemporary accounts that mention the Picts, such as King Alfred, in his translations of and additions to Bede and Orosius—Asser, in his life of Alfred—and the earliest Welsh chroniclers, do not appear to have been aware of any change whatever having at this time taken place in the government or condition of that people.

In the obscurity in which the matter is thus left, modern speculation has resorted to a variety of hypotheses. It has been conjectured that Kenneth MacAlpin never was king of the Dalriads at all; that he was most probably not a Scot, but a Pict; or that, if he was really the Dalriadic king, he was at the same time related, by some unrecorded marriage or other, to the Pictish royal family, and succeeded to that throne by the now established rule of inheritance; or that what has been called a conquest of the Picts by the Scots was in fact merely a union of the two nations and kingdoms; or, in fine, that what actually took place was not a conquest of the Picts by the Scots, but a conquest of the Scots by the Picts.

Nevertheless the antient accounts, though they have preserved no details, all either imply or expressly affirm that the Picts were conquered by Kenneth, king of the Scots. The 'Chronicon Pictorum' has 'Pictis..quos..Kinadius delevit.' The Register of St. Andrew's tells us that Kenneth reigned sixteen years over the Scots after he had destroyed the Picts (destructis Pictis); adding, that with wonderful cunning he led the Scots out of Argyle (Argadia) into the territory of the Picts. To the same effect are the accounts of Henry of Huntingdon and Giraldus Cambrensis in the twelfth century, in which, for the first time, we find a few details, which are amplified by Fordun and Winton and their successors.

And on the whole perhaps this view is attended with fewer difficulties, and accords better with ascertained facts of a subsequent date, than any other which it has been proposed to substitute. We must hesitate indeed as to the degree of faith to be given to the part of the story which makes the Picts to have been entirely swept away, and a Scottish population planted in their state throughout the whole extent of Kenneth's new kingdom. Such a total extermination of the Picts must have been as impracticable as would have been the supply of their places by a tribe which had hitherto occupied only the single district of Argyle. Besides, there is reason to suppose that in the contest which terminated in his acquisition of the Pictish crown, Kenneth MacAlpin must have had the Northern Picts for his friends and allies, in which case their destruction certainly would not have been one of the consequences of his success. Kenneth too and his immediate successors called themselves, or at least are called by both the Irish and Welsh annalists, sometimes kings of the Scots and the Picts, sometimes kings of the Picts merely; and the Picts continue to be spoken of as existing in North Britain for nearly two centuries after the date assigned to the Scottish conquest.

At the same time, it is by no means improbable nor inconsistent with the usages of those times, as evidenced by various well authenticated transactions, that the subjugation of the Southern Picts on this occasion should have been attended with a considerable change in both the proprietorship and occupation of the soil throughout the conquered country; that the chiefs should generally have been dispossessed of their lands; that the people of all ranks should have been partly put to death, partly driven from their habitations, partly reduced to slavery; and that the followers of the conqueror should in great numbers have abandoned their antient seats and settled in the new territory.

Throughout the tenth century, North Britain, ruled as one kingdom by the successors of Kenneth MacAlpin, appears to have been generally known by the name of Albania, undoubtedly the same with Albion, or Albin, which is the most antient name attributed to the island, and that by which the Gael of Scotland distinguish it to this day. [GAEL.] About the middle of this century however we find the name of Scotland beginning to be applied to North Britain; and from the commencement of the eleventh century the people of that country are commonly designated the Scots simply, and not the Scots of Britain, or of Albania, by way of distinction from the main body of the nation, which was till now considered as settled in Ireland. By this time the decay of the Irish Scots combined with the rising power and importance of their kindred in Britain to transfer to the latter and to their country the superior celebrity which the former had previously enjoyed.

The Scotland proper of this date comprised, as has been observed, only that part of the island to the north of the Forth and Clyde. But the south of modern Scotland, in whole or in part, was also occasionally comprised under the same name. It may be divided into three districts: 1, the eastern portion, called Lodonia, or Laodonia, a Teutonic term, signifying the march or border land; 2, the kingdom of Strathclyde, in the north-west; and 3, the district of Galloway, in the south-west. Lodonia, comprehending the Lothians and the other counties to the south of them, formed, from the middle of the fifth century, a part of the Anglo-Saxon kingdom of Bernicia, and the people appear to have been mainly Angles from that date; but the result of the battle of Dunnechtan (Dunnichen in Angus), fought in 685, between the Pictish king Brude, or Brudei, and the Northumbrian king Egfrid, was to transfer it to the dominion of the Picts. The claim of the English king to this territory however was occasionally renewed in after-times, till it was at last formally surrendered by Edgar to the Scottish king Kenneth IV. in 971. In 1005 it appears to have been overrun by the earl of the Northumbrians; but in 1020 it was again formally ceded to Malcolm II. (Allen's *Vindication of the Antient Independence of Scotland*, 8vo., Lon., 1833.) Strathclyde, comprehending, besides Lanark, Renfrew, and the northern half of Ayrshire, certainly at least the town and rock of Dunbarton, then called Alcluyd, which was its capital, and, as some suppose, a surrounding district of considerable extent to the north of the Clyde, was a Cymric or Welsh kingdom, and remained independent of the Scottish crown till the defeat of its last king Dunwallon by Kenneth III., at the battle of Vacornar in 973. The history of Galloway, which comprised the modern counties of Kirkcudbright and Wigton, together with the southern portion of Ayrshire, is very obscure; but it is spoken of as having been a Pictish country so early as the sixth century (by Jocelin, in his *Life of St. Mungo*), and the English historians notice the Picts of Galloway as appearing in the Scottish array at the battle of the Standard, fought in 1138. About the same period the government of the district was in the hands of a powerful Irish family of the name of Macdonall, of whom all that is known is that the first of the line was named Fergus. (Ritson's *Annals of the Caledonians*, &c., ii. 245.) These lords of Galloway, although practically independent down to this or even a somewhat later date, appear to have generally acknowledged themselves feudatories of either the Scottish or the English crown, most commonly of the former, to which they were eventually reduced under complete subjection. We may observe also that the district of Cumbria, lying within what is now called England, was made over to Malcolm I. king of the Scots, by the Saxon king Edmond I. in 946, and being held as an English fief, constituted an appanage of the Scottish crown from that date down to the year 1072.

The most valuable sources of the history of Scotland during the tenth, eleventh, and twelfth centuries, besides the Albanic Duan, the Pictish Chronicle, and the Register of St. Andrew's, already mentioned, the Saxon Chronicle, and the Melrose and a few other native chronicles, are the Irish Annals of Innisfallen, Buellan, and Ulster (published in O'Connor's 'Rerum Hibernicarum Scriptores Veteres'), the Welsh Triads, and the Annals of Caradoc of Nant-Garvan (published in the 'Welsh Archæology,' 3 vols. 8vo., 1801), and the Norse Sagas. By comparing these Irish, Welsh, and Norse accounts, which are found in general to agree with and support one another in the most satisfactory manner, Mr. Skene has in his late work thrown much new light upon the course of events during this period.

It appears that the Orkney and Western Islands having been taken possession of by the Norwegians in the end of the ninth century, Sigurd, the earl or king of the former, and Thorstein the Red, who, although for the present kept out by an insurrection of the natives, claimed the sovereignty of the latter, leaguing together, had made a descent upon the mainland of Scotland in the year 894, and quickly overrunning the greater part of the districts of Caithness, Sutherland, Ross, and Moray, had established there a Norwegian principality, which was given to Thorstein, and was held by him with the title of king of the half of Scotland, till he was defeated and slain, and his followers expelled, by the Scots in the year 900. Caithness however appears to have been reconquered by Thorfinn, earl of Orkney, about the middle of the tenth century. In 986 a confederacy of the chieftains of the north of Scotland, headed by Finlay the Maormor or great chief of Moray, made an attempt to drive the Norwegians from this possession; but they were defeated by the forces of Earl Sigurd, a successor of Thorfinn, who, pursuing his success, speedily succeeded in reducing to his authority not only the whole of the territory that had formerly been held by Thorstein the Red, but in addition the antient Scottish kingdom of Argyll (or Dala, as it is often called, that is, 'the territory,' as if pre-eminently, the term being the same that enters into the composition of the name Dal Riada). Sigurd retained these acquisitions for some years; but a general rising of the northern Maormors at length succeeded in once more clearing the whole of Scotland of the Norwegians in the year 993. The able and fortunate leader in this national liberation was Malcolm, Maormor of Moray, the nephew of Finlay mentioned above; and he turns out to be the person who a few years after, by the defeat and death of Kenneth V. (called Macduff or Grim), acquired possession of the throne of his native country under the title of Malcolm II. 'In what his title to the crown consisted, or what was the nature of the claim which he made to it,' says Mr. Skene, 'it is impossible now to determine; but certain it is that he was supported in his attempt by the whole of the inhabitants of the northern parts of Scotland; and in order to obtain the countenance of a people so singularly tenacious of their antient customs, he must have possessed a stronger claim than what mere power or influence could give him, more especially as his descendants for many generations afterwards constantly asserted their right to the throne of Scotland, and as invariably received the assistance of the Celtic portion of its inhabitants. In all probability the Highlanders were attempting to oppose the hereditary succession in the family of Kenneth MacAlpin, and to introduce the more antient Pictish law.' Soon after his accession, Malcolm, having effected a reconcilement with his old enemy Earl Sigurd, gave him his daughter in marriage, and, after a reign of twenty-six years, died in 1029. On his death the Scottish faction succeeded in raising to the throne another Malcolm, the son of Kenneth Macduff, whom the late king had defeated and slain. This Malcolm MacKenneth, immediately after his accession, proceeded to take his measures for dispossessing Sigurd's son and successor Thorfinn of the district of Caithness, with which he had been invested by his maternal grandfather; and a long war followed between the Scottish king and the Norwegian earl, which terminated, in 1034, in the defeat and death of the former; events which were forthwith followed by the complete subjugation of Scotland by Thorfinn, as far south as to the Frith of Tay. The greatest inconsistency and confusion has been introduced into the narrative given by Fordun and his successors of this portion of Scottish history, by their substitution of only one Malcolm for these two kings of that name, who were not only of different families, but of altogether opposite polities and conduct. Hence, among other things, some of the Scottish authorities make Malcolm II. to have been slain in battle, others to have died in his bed. (Pinkerton, *Enquiry*, ii. 192.) The Irish Annalists agree with the Norse Sagas in the above account.

The Norwegian kingdom thus founded in the north of Scotland by Thorfinn lasted for thirty years. It comprehended the whole of Scotland to the north of the Tay, with the exception only of the mountain districts of Argyle and Athol. Nor did the establishment of the Norwegian dominion in these parts imply merely a change of masters to the inhabitants. It was, to a great extent, a change of the population itself. 'Earl Thorfinn,' says the Norse Saga, 'drove the scattered remnants of the Scottish army before him, and subjugated the whole country in his progress, even as far as the district of Fife.' The natives, after their submission, rose, upon a portion of the invading army being withdrawn; but when Thorfinn re-assembled his forces, 'the Scots,' continues the account, 'did not attempt to defend themselves, but fled immediately to the woods and deserts. Then Earl Thorfinn, when he had driven the fugitives away, declared that he would burn and lay waste the whole country, in revenge for their treachery. His men then spread over the whole conquered country, and burned every hamlet and farm, so that not a cot remained. Every man that they found they slew, but the old men and women fled to the deserts and woods, and filled the country with lamentation. Some were driven before the Norwegians and made slaves.' This passage affords a curious and valuable illustration of the nature and manner of these antient Norse subjugations.

On the death of Malcolm MacKenneth, the part of the country that remained unsubdued appears to have acknowledged as his successor Duncan, the son of his daughter Bethoc, whose father, Crinan, commonly designated Abbot of Dunkeld, is considered by Mr. Skene to have been one of the maormors or chiefs of the Northern Picts. If that was the case, the elevation of Duncan to the throne may be regarded as an arrangement recommended by its accordance with both the Pictish and the Scottish principles of succession,--the elective and the hereditary,—and as such peculiarly suitable in the present circumstances of the country. After six years of an undisturbed reign, Duncan, in 1040, during a temporary absence of Thorfinn, putting himself at the head of an army, marched upon the dominions of that prince, and is said to have made his way as far north as the district of Moray without encountering any resistance. And even at this point he was, according to Mr Skene's theory, opposed not by the Norwegians, but by the Gaelic inhabitants, who, it seems, 'preferred remaining under the Norwegian yoke, rather than submit to a chief of their own race whose title to the throne they could not admit.' These Celts were commanded by Macbeth, the Maormor of Moray, who, attacking Duncan near Elgin, defeated and slew him, and then, overrunning the whole of the country that had hitherto acknowledged the sway of Duncan, assumed the title of king of Scotland. It is most probable that Macbeth, in the whole of this affair, acted as the ally of Thorfinn, who naturally repaid the assistance he had rendered in overthrowing Duncan, by supporting him in his seizure of the vacant throne. Macbeth was probably the near relation and representative of the late Malcolm II. (who, it may be recollected, had been also Maormor of Moray), and as such he would be the hereditary friend of Thorfinn and the Norwegians, as well as, in the estimation of his own clan, and perhaps of the Anti-Scottish population generally, the true heir to the crown.

But the next quarter of a century produced a series of revolutions, which again changed the condition of things in every part of Scotland. Macbeth in the south, and his friend Thorfinn in the north, reigned undisturbed till the year 1045, when the adherents of the Scottish family rose against the former, under the conduct of Duncan's father, Crinan; but this attempt was soon crushed, by the defeat of Crinan in a great battle, in which he himself fell, with, as the Irish annalist expresses it, 'nine times twenty heroes' more of his party. His success secured Macbeth nine years more of tranquillity; but in 1054 he was again attacked by a Saxon force, under the command of Siward, earl of Northumberland, which had been obtained from Edward the Conqueror by Duncan's eldest son Malcolm, who, after his father's death, had taken refuge at the English court: and the result of this invasion was the complete expulsion of Macbeth from the country to the south of the friths of Forth and Clyde, and the establishment of Malcolm (surnamed Canmore, or Great Head) as king of that part of Scotland. The authority of Malcolm continued to be confined to the Lothians till 1058, when an expedition of Thorfinn, aided by the son of the king of Norway, against the English king, while it failed in its object, drew down the vengeance of Edward upon the Norwegian earl and his ally Macbeth, whom a second Saxon invasion drove as far north as Lumphanan in Aberdeenshire, where he was overtaken and slain in battle. His regal title was assumed by Lulach, whom one account makes to have been the son of his cousin Gilcomgain; another, the grandson of a brother of his queen Gruoch, the daughter of Bodhe; but he too was defeated and slain, after a nominal reign of three or four months, at Essie in Angus; and Malcolm was left undisputed master of as much of his father's kingdom as remained unconquered by Thorfinn. That Norwegian however held his own till his death, in 1064, and even then the people of the north refused to submit to Malcolm, but set up a king of their own, Donald MacMalcolm, who is styled, like Malcolm II. and Macbeth, Maormor of Moray, and was probably of the same family with them. It cost the able and persevering Malcolm Canmore many years of continued warfare before he succeeded in putting down this opposition to his authority; but at last, in 1085, we find the Saxon Chronicle recording the slaughter both of Donald MacMalcolm, who is styled king of Alban, and of his ally, Maolsnechtan, the Maormor of Moray, the son of the late king Lulach,—events which seem to have put an end to the contest, and to have brought the whole of Scotland under subjection to Malcolm, unless it might be that Caithness still remained in the hands of the Norwegians.

The reign of Malcolm Canmore terminated in 1093, and his death immediately gave rise to a new conflict between two opposite principles of succession to the throne,—the population of the Lowlands, now to a great extent Saxon, supporting the claim of Duncan, whom the Scottish historians call the natural son of the late king, but who is, with more probability, represented as his legitimate son by the Sagas,—the Celtic tribes of the north asserting the right of Malcolm's brother, Donald Bane, in conformity with what is called the system of tanistry, which, brought by the Dalriads from their former country, Ireland, had probably till now regulated the succession in the Scotic royal family, both in their first seat and since they had succeeded to the Pictish crown. From this date the elective system, which seems to have been the original constitution of the Pictish monarchy, and is perhaps to be derived from the appointment of Galgacus as general leader of the Caledonians, in the year 84, may be regarded as extinct. But the peculiar modification of the hereditary principle to be found in the system of tanistry was perhaps naturally still less able to maintain itself against the more perfect recognition of that principle, than the elective system had been to maintain itself against tanistry; for the chief cause which would be always at work under the elective system to introduce the hereditary principle, namely, the wish of the reigning king to perpetuate the crown in his own family, would operate almost as powerfully against tanistry as against the elective system itself, while the former wanted altogether that strength of another kind which belonged to the latter. Tanistry however had one recommendation in common with the elective system, which gave it some advantage in an unadvanced state of society:—the successor it provided to the throne was always a full-grown man, able to perform in his own person all the functions of royalty. It had the advantage also, when it was brought into competition with the more perfect form of the hereditary principle on the present occasion, that it had been for some time the established system,—that it was the old law of the country, to which the habits, feelings, and prejudices of the mass of the antient population were attached or reconciled; whereas the rival system was not only an innovation, but peculiarly distasteful as an importation from another country, and as supported and attempted to be forced upon the Scots by the foreign race which had intruded itself and so many more of its customs into the land only within the last few years. But both these advantages were of a nature to have their value and importance diminished by time and the progress and consolidation of society. Meanwhile the contest as begun between Donald Bane and Duncan, arrayed, as we have observed, Saxon against Celtic Scotland, and such continued to be the character of the struggle between the two principles of succession so long as it subsisted. The population however of by far the greater part of the country was already of a very mixed description. Without reverting to the questions of in how far even the purest part of the present Celtic population was to be considered the representative either of the antient Picts and Caledonians or of the Dalriadic Scots, it is probable that the course of events during the preceding century must have made at least the whole of the eastern half of the country, from the Pentland Frith to the Tay, more Norwegian than Celtic, and the last reign may be presumed to have almost equally Saxonised whatever of Southern Scotland had remained Celtic up to the accession of Malcolm Canmore. The English education of that king at the court of the Confessor, his marriage with Margaret, the sister of Edgar Atheling, and the Norman conquest of England, which happened in the early part of his reign, all co-operated to make himself and his court more Saxon than Celtic, and to induce great numbers of the English Saxons to flock to Scotland and settle there in his time. In fact, as has been remarked, 'the Norman conquest of England, in nearly the same degree that it made Saxon England Norman, made Celtic Scotland Saxon.' (*Pict. Hist. of Eng.*, i. 537.) It is to be remembered however that, as already pointed out, the population of the eastern coast of Scotland to the south of the Forth,—of the part of the country antiently called Lodonia, or the Lothians,—had been mainly if not exclusively Saxon for some ages before this date. To what extent, if at all, the two Teutonic races that had thus before the close of the eleventh century acquired possession of the whole of that side of the kingdom, were now, or became at a later date, mixed with one another, need not here be considered. For the present, circumstances tended rather to divide the Northmen and Saxons, and to oppose them to one another, than to unite them. The Norwegians, as we have seen, had taken part with the Northern Celts in all the internal contentions of Scotland ever since the commencement of the reign of Malcolm II., in 1004. Their whole race had been the hereditary enemies of the English Saxons for some centuries. They themselves, the Scottish Northmen, had had a special quarrel of their own with the English ever since the expedition of Earl Siward in 1054. It is probable, in fact, that they considered themselves as the natural allies rather of William the Conqueror and his French Normans, than of the previous Saxon rulers of South Britain, or of the Saxon interest in Scotland, which supported the descendants of Malcolm Canmore. Add to all this that Donald Bane, as having passed his life among the Celts of the Hebrides, was for that reason personally acceptable to the people of the north, and had probably always been looked upon by them as the representative of the old national interest, in opposition to the foreign habits and predilections of his elder brother.

In entering upon his contest with Duncan, Donald Bane was powerfully assisted by Magnus Barefoot, king of Norway, to whom Malcolm Canmore, in the last year of his reign, had been forced to cede the Western Islands, and who now probably arranged with Donald that if he was successful in his attempt upon the throne, he should confirm that grant. This alliance enabled Donald in the first instance to carry everything before him, and the establishment of his authority is said to have been immediately followed by the expulsion of all the Saxons who had settled in the Lowlands of Scotland during the late reign. But after a few months, Duncan came against him with a numerous army from England, permission to raise which he had probably obtained from William Rufus by consenting to hold the Scottish crown as the vassal of the Norman king; and Donald was obliged to give way before the invader. It appears however that even Duncan was not able to protect the Saxon settlers who had thus returned with him; he found it necessary to drive them all once more out of the country, even as had been done by Donald Bane; a concession to the popular cry however by which he gained nothing, for as soon as his Scottish subjects found him thus naked of foreign protection, they rose and put him to death, and replaced his uncle on the throne. But two years afterwards, another English army, conducted by Edgar Atheling, again overpowered Donald, and set the crown on the head of Edgar, a brother of Duncan. That result finally decided the contest between the two principles of succession, and also the struggle for supremacy between Celtic and Saxon Scotland. Edgar, whose accession took place in 1097, was succeeded, after a reign of ten years, by his brother Alexander I., and he by his brother David I., whose reign extended to the year 1153. In the reign of Alexander, the Highlanders of the district of Moray rose under Ladman, a son of Donald Bane; but that vigorous king instantly took such measures as not only crushed the revolt, but rid him for ever of his unfortunate rival. On the death of David however, and the accession of his grandson Malcolm, surnamed the Maiden, a child only in his eleventh year, the two systems of succession again came into collision; and an attempt was made by the Highlanders to maintain, in opposition to the feudal heir, the claim of William, styled the Boy of Egramont, who was a grandson of Malcolm Canmore's eldest son Duncan; but although this new pretender and his descendants repeatedly renewed their efforts, not only while Malcolm occupied the throne, but throughout the long reign of his brother and successor William the Lion, and even in the early part of that of William's son, Alexander II., they were always discomfited. The last of Duncan's descendants, or pretended descendants, Gilliescop MacScolane, was put to death, with all his sons, by Alexander II., in 1222; and from that date no further attempt was made to dispute the rights of the reigning family.

It was not however till fully two centuries later that the rule of the king of the Scots was completely established over the whole of Scotland. 'On the accession of Edgar,' says Mr. Skene, 'those districts which had formed part of Thorfinn's kingdom appear to have remained in the possession of the native chiefs, who had regained them on the fall of that kingdom; but the rest of the country, consisting of the territories on the north of the friths of Forth and Clyde, which the Scots had wrested from the Southern Picts, and which had fallen to the royal house founded by Duncan, in addition to the whole of the country south of the friths, became the absolute property of the king; and here we find the Saxon population and Saxon institutions principally established. In imitation of the Anglo-Saxon kingdom, this part of the country was divided into earldoms, which were bestowed upon members of the royal family; Saxon thanes were introduced over the whole country; sheriffs and sheriffdoms everywhere established; and thus during the reigns of Edgar and Alexander I. the whole of Scotland, with the exception of what had formed the kingdom of Thornfin, exhibited the exact counterpart of Saxon England, with its earls, thanes, and sheriffs; while the rest of the country remained in the possession of the Gaelic Maormors, who yielded so far to Saxon influence as to assume the Saxon title of earl.' From the reign of Alexander's successor David I. we are to date the introduction of Norman institutions into Scotland. Of the great Highland chiefs, the earls of Moray continued to be the most formidable till the year 1161, when that antient line, which, always in league with the Norwegians, had either asserted its own claims to the throne, or been the chief support of some other pretender, ever since the death of Malcolm II. in 1029, was at length stripped of its power and its possessions by Malcolm the Maiden, and the title it had enjoyed transferred to the earls of Mar. Upon their ruins the earls of Ross rose into eminence, and for some time acquired the ascendancy in the Highlands; but from the cession of the Hebrides by the Norwegians in the year 1266, the most powerful family of the north came to be that of the Macdonalds, the Celtic chiefs of these islands, who styled themselves Lords of the Isles, and having been accustomed to acknowledge only a nominal subjection to the Norwegian king, were little disposed to yield more submission to the king of Scotland, and indeed affected to carry themselves in almost all respects as independent sovereigns. But the strength of the Macdonalds, which had been broken by the defeat of Donald, Lord of the Isles, at the battle of Harlan, fought in 1411, during the regency of the duke of Albany, was destroyed by the effective measures taken to curb the Highland chiefs by James I. on his return from England a few years after. From this epoch may be dated the complete reduction of Celtic Scotland under the sceptre of the Saxon king of the Lowlands. The lordship of the Isles was finally extinguished by the forfeiture of the last lord in 1493.

The further details and revolutions of the history of Scotland will be found under the names of the more eminent kings. The succession of the kings from the epoch of the Scottish conquest is as follows:—

A.D.
843. Kenneth MacAlpin, styled Kenneth II.
859. Donald III., brother of Kenneth.
863. Constantine II., son of Kenneth.
882. Hugh, brother of Constantine.
882. Grig, called Gregory the Great, one of the northern chiefs, with Eocha or Eth, a grandson, by a daughter, of Kenneth MacAlpin.
893. Donald IV., son of Constantine II.
904. Constantine III., son of Hugh.
944. Malcolm I., son of Donald IV.
953. Indulf, son of Constantine III.
961. Duff, son of Malcolm I.
965. Culen, son of Indulf.
970. Kenneth III., son of Malcolm I.
994. Constantine IV., son of Culen.
994. Kenneth IV., surnamed Grim, son of Duff.
1004. Malcolm II., Maormor of Moray.
1029. Malcolm III., son of Kenneth IV.
1033. Duncan, grandson, by a daughter, of Malcolm III.
1040. Macbeth, Maormor of Moray.
1058. Malcolm IV. (commonly called III.), surnamed Canmore, son of Duncan.
1093. Donald Bane, brother of Malcolm Canmore.
1093. Duncan, son of Malcolm Canmore.
1095. Donald Bane restored.
1097. Edgar, son of Malcolm Canmore.
1107. Alexander I., brother of Edgar.
1124 David I., brother of Alexander I.
1153. Malcolm V. (commonly called IV.), surnamed the Maiden, grandson of David I.
1165. William, surnamed the Lion, brother of Malcolm.
1214. Alexander II., son of William.
1249. Alexander III., son of Alexander II.
1286. Margaret, called the Maiden of Norway, granddaughter, by a daughter, of Alexander III.
1290. Interregnum.
1292. John Baliol, great-grandson, by a daughter and granddaughter, of David, earl of Huntingdon, younger brother of William the Lion.
1296. Interregnum.
1306. Robert Bruce, great-great-grandson, by a younger daughter, of David, earl of Huntingdon.
1329. David II., son of Robert Bruce.
1332. Edward Baliol, son of John Baliol.
1341. David II. restored.
1370. Robert Stuart, surnamed Blear-eye, grandson, by a daughter, of Robert Bruce.
1390. Robert III., called John Fernyear, son of Robert II
1406. James I., son of Robert III.
1437. James II, surnamed With the Fiery Face, son of James I.
1460. James III., son of James II.
1488. James IV., son of James III.
1513. James V., son of James IV.
1542. Mary, daughter of James V.
1567. James VI., son of Mary, who succeeded to the crown of England in 1603.

To the publications of Innes, Pinkerton, Ritson, Skene, and others, referred to above, on the earliest period of Scottish history, may be added, as among the most important and valuable of the numerous modern works on that subject, Gordon's 'Itinerarium Septentrionale,' fol., Lon., 1726; Horsley's 'Britannia Romana,' fol., Lon., 1732; Roy's 'Military Antiquities of the Romans in Great Britain,' 2 vols. fol., Lon., 1793; and Chalmers's 'Caledonia,' 3 vols. 4to., Lon., 1807-24. See also the list of works at the end of the article PICTS. The most important of the original sources of information for this period have been already indicated.

The principal of the old native historians are Fordun, Major, Boece, Lesly, and Buchanan, who wrote in Latin between the middle of the fourteenth and the end of the sixteenth century; and Lindsay of Pitscottie, Monipennie, and Knox, who wrote in their native dialect in the sixteenth century; all of whom may be regarded as to a certain extent original or contemporary authorities. To these may be added the poetical or rhyming chronicles of Wyntown, Barbour, and Blind Harry, which belong to the fourteenth and fifteenth centuries, and, amid much legendary matter, contain some facts not elsewhere to be found. To the early part of the seventeenth century belongs Dempster's 'Menologium Sanctorum Scotorum,' afterwards republished under the title of 'Historia Ecclesiastica Scotorum.' This is a sort of literary history of Scotland. The principal histories of ecclesiastical affairs are Archbishop Spotswood's 'History of the Church of Scotland, from A.D. 203 to 1625,' fol., Lon., 1655; Calderwood's 'True History of the Church of Scotland, from the beginning of the Reformation unto the end of the reign of James VI.,' fol., 1678; Wodrow's 'History of the Sufferings of the Church of Scotland from the Restoration to the Revolution,' 2 vols. fol., Edin., 1721-2; and Keith's 'Catalogue of Scottish Bishops,' 4to., Edin., 1755. There are also the curious diaries of Birrel, Bannatyne, Sir James Melvil, the Rev. James Melvil, Spalding, and others, written in the Scotch of the sixteenth and seventeenth centuries.

The best modern works on the later periods of Scottish history are Dalrymple's 'Annals from 1057 to 1371,' 2 vols. 4to., 1776, 1779; Pinkerton's 'History from the Accession of the House of Stuart to that of Mary,' 2 vols. 4to., 1797; Robertson's 'History during the Reigns of Queen Mary and of King James VI. till his Succession to the Crown of England,' 2 vols. 4to., Lon., 1758; Laing's 'History from the Union of the Crowns to the Union of the Kingdoms,' 4 vols. 8vo., Lon., 1804; and Tytler's 'History from the Accession of Alexander II. to the Union of the Crowns,' now in course of publication.

SCOTLAND, UNION WITH. The attempts made to subjugate Scotland by the first and second Edwards, in the end of the thirteenth and the early part of the fourteenth century, having proved unsuccessful, the notion of an incorporation of the two kingdoms can scarcely be said to have entered into the schemes or contemplations of practical English statesmanship, except on one or two occasions for a moment, till the course of events united the two crowns about 300 years later. It does not appear that such a consequence was much thought of at the time as likely to flow from the marriage of Henry VII.'s daughter Margaret with James IV. of Scotland in 1503. That marriage had been proposed by the Scottish king, and merely as the surest way of putting an end to the wars between the two countries that had been constantly breaking out, and all that Bacon, writing in the time of James I., ventures to say, is, 'that the joy of the city (of London) thereupon showed, by ringing of bells and bonfires, and such other incense of the people, was more than could be expected, in a case of so great and fresh enmity between the nations, especially in London, which was far enough off from feeling any of the former calamities of the wars; and therefore might be truly attributed to a secret instinct and inspiring, which many times runneth not only in the hearts of princes, but in the pulse and veins of people, touching the happiness thereby to ensue in time to come.' Perhaps Henry himself however saw deeper into the future: during the treaty, which was almost three years under consideration, 'it is reported,' Bacon tells us, 'that the king remitted the matter to his council; and that some of the table, in the freedom of counsellors, the king being present, did put the case, that if God should take the king's two sons without issue, that then the kingdom of England would fall to the king of Scotland, which might prejudice the monarchy of England. Whereunto the king himself replied, that if that should be, Scotland would be but an accession to England, and not England to Scotland, for that the greater would draw the less, and that it was a safer union for England than that of France. This passed as an oracle, and silenced those that moved the question.' (*History of King Henry VII.*) And it is probable enough that this remark of the sagacious king, working its way into the national mind, may have had considerable effect in reconciling old prejudices to the succession of the Scottish king when it actually took place exactly a century after.

At any rate we may assume it as quite certain that nothing but such a previous union of the crowns would have made the legislative union of the two countries possible. An attempt made by Henry VIII., after the death of James V. in 1542, to bring them under one sceptre by means of a marriage between James's infant daughter and successor Mary and his son Edward, was soon abandoned. Fortunately, from the rule of succession being in all points the same in both kingdoms, the union of the crowns, which took place in the person of James I., was not an arrangement which a change of circumstances might afterwards break up, but placed the two countries under the same king for all time coming.

As soon as James found himself seated on the English throne, he addressed himself with great earnestness to the bringing about of a legislative union between his two kingdoms. [GREAT BRITAIN.] This project formed the burthen of the very long and characteristic speech with which he opened his first parliament, 19th March, 1604. Having mentioned the confirmation of the union of the houses of York and Lancaster in him by his 'descent lineally out of the loins of Henry VII.,' he went on to observe that the union of these two princely houses was nothing comparable to the union of the two antient and famous kingdoms which were brought together in his person; and then he went on at great length to argue and enforce the advantages of the connection thus established, and to insinuate the expediency of making it still closer. 'What God hath conjoined, then,' he said, 'let no man separate. I am the husband, and all the island is my lawful wife; I am the head, and it is my body; I am the shepherd, and it is my flock. I hope therefore no man will be so unreasonable as to think, that I, that am a Christian king under the Gospel, should be a polygamist and husband to two wives; that I, being the head, should have a divided and monstrous body; or that I, being the shepherd to so fair a flock (whose fold hath no wall to hedge it but the four seas), should have my flock parted in two. . . . . And as God hath made Scotland (the one-half of this isle) to enjoy my birth, and the first and most imperfect half of my life, and you here to enjoy the perfect and last half thereof; so cannot I think that any would be so injurious to me, no, not in their thoughts and wishes, as to cut asunder the one half of me from the other.' But although James concluded this part of his address by expressing his conviction that in their hearts and minds his hearers all applauded his discourse, we are informed by the historians of the time that neither his logic nor his rhetoric was received with the approbation he expected; and we know that his efforts to bring about the union wholly failed. On the 14th of April the lord chancellor moved in the Lords that some proposition might be made to the lower house for a conference about this affair; and, the motion being agreed to, a conference took place accordingly that afternoon. Two days after, the Commons sent a message to the Lords expressing their feeling that the matter ought to be proceeded in with great caution and deliberation, and objecting to have any more conferences till every man of their house had considered of and delivered his opinion about it. On the 21st a draft of a plan for the union, devised by the king himself, was read to the Lords by the Lord Cecil; and another conference took place between the two houses on the 30th, which resulted in a bill being brought in and passed appointing certain English commissioners to treat with others to be named by the parliament of Scotland concerning such union. (Stat. 1 Jac. I., c. 2.) James's proposals are preserved, and are printed in the 'Parliamentary History,' together with a letter from his majesty to the Commons, rating them roundly for the slight regard in which they appeared to hold his scheme. The affair had been debated for several days together in that house; and notes of the arguments on both sides are entered on the journals: but the prevailing opinion of the members may be gathered from the way in which they took up the publication of a book or tract in favour of the union by Dr. Thornborough, the bishop of Bristol, which, on the 30th of May, we find them complaining of to the Lords as a breach of privilege, and for which the bishop in the end was obliged very formally to confess himself in the wrong, and to beg forgiveness. His declaration of error was recorded in the journals of the Commons, and the book was suppressed. Meanwhile little or nothing was done by the commissioners: they 'no sooner met,' says the Parliamentary History, 'than they found the matter impracticable; for the Scotch, though we had taken their king, absolutely refused to be governed by any of our laws.' But the aversion to the measure at this time was probably very nearly as strong among the English as the Scotch. The business was resumed in the next session (1605-6), when several more conferences were held, and another act explanatory of that of the last session was passed (Stat. 3 Jac. I., c. 3), but with no further result. James however again took up the subject in the speech which he delivered at the commencement of a new session, 18th November, 1606, and which he professed to be to a great extent extempore: in introducing this part of his address in particular, he said that 'the goodness of the matter must supply his want of premeditation; for that which he should say must proceed out of some inspiration, because he had so small a time of respiration to consider it; but that gold did not need to be gilded, nor precious stones any ornament.' He then proceeded, first 'to answer all objections that by men of humorous or malicious minds were opposed against this union;' and to point out the advantages of the measure and the mode of carrying it into effect. In consequence of this warm recommendation, the business occupied parliament throughout nearly the whole of that session; but although an instrument of union, drawn up by the commissioners, was laid before both houses, and many more conferences and debates took place, all that was done was to pass an act 'For the utter abolition of all memory of hostility and the dependences thereof between England and Scotland, and for the repressing of occasions of discord and disorders in time to come.' (Stat. 4 Jac. I., c. 1.) The principal discussion arose on the naturalization of Scotsmen, both those born since and those born before the king's accession,—the post-nati and ante-nati, as they were styled,—in favour of which concession Bacon, then solicitor-general, exerted himself with particular zeal. The objections that were advanced were various, but, as Rapin observes, 'the most prevailing argument, though it was not publicly insisted upon, was the jealousy of the English, which baffled all Bacon's rhetoric.' On the 31st of March, 1607, James sent for both houses to Whitehall, and took them to task for their dilatoriness in an harangue which occupies sixteen closely printed columns of the Parliamentary History; and on the 2nd of May, on their reassembling after the Easter holidays, he addressed them once more on the subject at considerable length. But neither of these elaborate orations of his majesty appears to have made much impression. Two years after however the decision of the judges in the Exchequer chamber in Calvin's case determined that Scotsmen born after the king's accession to the English crown, were entitled to purchase and inherit lands in England. (*State Trials*, ii. 559-696.)

The first actual union of England and Scotland was effected in the time of the Commonwealth. In 1652 the Long Parliament, after Monk's subjugation of Scotland, sent down Sir Harry Vane, St. John, and other commissioners to obtain from the Scottish shires and boroughs their consent to a union with England; upon which, as Ludlow tells us, 'eighteen of one and thirty counties, and twenty-four of sixty-six cities and boroughs, consented to send their deputies to the parliament of England, most of the rest excusing themselves for want of money to defray the expenses of their representatives.' (*Memoirs*, i. 401.) A bill was afterwards brought in for incorporating the two countries into one free commonwealth; but it appears that it had not been carried through its last stage when the parliament was dissolved by Cromwell on the 20th of April, 1653. Five representatives for Scotland and six for Ireland sat among the 144 persons who met on the summons of Cromwell and the Council of Officers, 5th July, 1653, and formed what is known by the name of Barebones' Parliament. The affair of the union afterwards received its completion from Cromwell, who, in an act or decree issued on his own authority as Lord Protector, 12th April, 1654, entitled 'Scotland made one Commonwealth with England,' declared Scotland and its dependencies to be incorporated with England, and provided that thirty members from Scotland should sit in every future Parliament. It had in the preceding December been declared in the Instrument of Government by which Lambert and the Council of Officers, after the dismissal of Barebones' Parliament, made over the supreme authority to Cromwell, that the three kingdoms of England, Scotland, and Ireland should be united into one commonwealth and government, and that England should be represented in parliament by 400 members, Scotland by 30, and Ireland by the same number. Accordingly the representatives from Scotland, and also from Ireland, sat both in the parliament which met 3rd September, 1654, and in the immediately succeeding one which met 17th September, 1656. It should seem however that the force of the Protector's edict came in course of time to be disputed or doubted; for immediately after the assembling of the last-mentioned parliament we find bills brought in for uniting Ireland and Scotland into one commonwealth with England. (Burton's *Diary*, i. 6 and 12-18.) And several debates afterwards took place on the validity of the ordinance of April, 1654, and the necessity of the proposed measures; which however were not completed when the parliament was dissolved by Cromwell, 4th Feb, 1658. (Burton, i. 346, 353, and ii. 57.) The Scotch and Irish members also took their seats in Richard Cromwell's parliament, which assembled 27th January, 1659; and, although the question of their right to sit gave occasion to long debates (Burton, iv. 112-193), a vote in their favour was at last carried by a considerable majority. It is to be observed, that the style of the united Commonwealth, which may thus be said to have subsisted from July, 1653, to the meeting of the Convention Parliament (which restored the king) in April, 1660, was the Commonwealth, not of Great Britain and Ireland, but of England, Scotland, and Ireland, and of the dominions and territories thereunto belonging.

The project of a union with Scotland was renewed in the reign of Charles II., and in 1670, the subject having been particularly recommended to parliament in the speech from the throne, an Act was passed authorising his majesty to appoint commissioners to treat for that purpose with others to be appointed in the same manner by authority of the Scottish parliament. (Stat. 22 Car. II., c. 9.) The Scottish parliament passed a corresponding Act, and the commissioners on both sides were named and met; but according to the writer of the account of this reign, in Kennet's 'Complete History,' 'after many conferences, and seeming resolutions of agreement in the main things, they broke off in mutual jealousies and a general dissatisfaction.' He adds, 'I have heard [that] one of the Scots commissioners themselves confessed it was their own fault in being over wise and nice in the smaller terms of accommodation.' According to a modern writer, the Scottish commissioners, 'instructed by the insignificant share which their country acquired in the government during the usurpation, refused, on a subsequent treaty, to accede to a union unless the Scottish estates were preserved entire, and, instead of a proportional representation, the two parliaments were incorporated into one.' (Laing's *History of Scotland*, iv. 58.)

The scheme of a union between the two countries was again agitated in the beginning of the reign of king William, who, in his letter to the Scottish convention, dated 7th March, 1689, stated that he had been glad to find so many of the nobility and gentry of Scotland, when in London, so much inclined to the proposal, and declared his resolution to use his utmost endeavours in advancing everything that might conduce to the effectuating the same. The convention, in compliance with this representation, nominated commissioners to treat upon the subject, and William, in opening the first session of his second parliament, 21st March, 1690, expressed his desire that commissioners might also be nominated in England, 'to see if such terms could be agreed on as might be for the benefit of both nations,' so as to be ready to be presented to parliament in some future session. But it does not appear that anything was done in consequence. In his last message to the House of Commons, 28th February, 1702 (five days before his death), his majesty again in very earnest terms recommended the union to the consideration of parliament, as that than which nothing could more contribute to the present and future security and happiness of both countries.

In pursuance of this recommendation, immediately after the accession of Anne a bill was brought into the House of Commons for empowering her majesty to appoint commissioners to treat with others from Scotland for a union between the two kingdoms, which, although warmly opposed, was in the end carried through both houses by great majorities. (Stat. 1 Ann., c. 8.) A similar Act having been passed by the parliament of Scotland, commissioners were appointed for both kingdoms, who met for the first time at the Cockpit, 22nd October, 1702. But after having agreed 'that the two kingdoms should be inseparably united into one monarchy under her majesty, her heirs and successors, and under the same limitations, according to the Acts of Settlement,' such difficulties arose out of a proposition of the Scotch commissioners for preserving the exclusive rights and privileges of the Darien Company, that no further progress could be made; and the parliament which met in Scotland the next year annulled the commission.

The subject however was again taken up by the English parliament in the session which began on the 29th of October, 1704; and an act was passed (Stat. 3 and 4 Ann., c. 6) 'For the effectual securing the kingdom of England from the apparent dangers that may arise from several acts lately passed in the parliament of Scotland,' which again authorised her majesty to nominate commissioners to treat of the union as soon as the Scottish parliament should pass an act for the same purpose. Meanwhile, till the succession of the crown of that kingdom should be settled in the same way as that of the crown of England, natives of Scotland were declared to be aliens, and the importation of cattle, sheep, and coal from that country was prohibited. The consequence was, that in the next session of the Scottish parliament, which began 28th June, 1705, the act required was passed, though not without strong opposition, a protest of the Duke of Athol against it being adhered to by 25 peers, 35 barons (or representatives of shires), and 18 members for boroughs. On this the late English act was immediately repealed (by stat. 4 and 5 Ann., c. 15). The Scottish commissioners, 31 in number, having been appointed by the queen on the 27th of February, 1706, and the English, also 31, on the 10th of April, met for the first time in the Cockpit at Whitehall on the 16th of that month. Their deliberations were continued till the 22nd of July, when the articles were signed and sealed, and on the next day they were presented to the queen at St. James's. They were still however kept a profound secret from the public. The Scottish parliament was opened, for the last time, on the 3rd of October, by the Duke of Queensberry as high commissioner; and the discussion on the proposed union was commenced on the 12th. The articles were warmly opposed in debate; many petitions were presented against the measure; and the violence of the Edinburgh populace became so threatening, that it was at length deemed expedient that the parliament should carry on its deliberations under the protection of a military force; but on the 4th of November the first article was approved of by a majority of 33 votes; and in the end all the other articles were carried, without being subjected to any alteration of consequence. The last, the 25th, was agreed to on the 14th of January, 1707; and on the 16th the Act of ratification was carried by a majority of 110 against 69. According to the 'Memoirs' of George Lockhart, Esq., of Cornwall, a sum of 20,540*l*, was distributed from the English treasury among the members, lords and commoners together, to secure their votes. On the 25th of March the parliament was prorogued, or adjourned, by Queensberry to the 22nd of April; but it never met again.

Meanwhile the English parliament had met on the 3rd of December; and on the 28th of January the queen came to the House of Lords, and intimated, in a speech from the throne, the ratification of the treaty by the parliament of Scotland. The discussion of the articles was commenced in the Commons, in a committee of the whole house, on the 4th of February; and, after little opposition or debate, the report of the committee, approving of them, without any amendment, was received on the 8th. The subject appears to have undergone somewhat more discussion in the Lords; but in that house too all the articles were approved of by great majorities. In a division which took place, on the 15th of February, on the 22nd article, the numbers are noted to have been, contents 71, not contents 22. The articles were then formed into a bill, which her majesty came down to the House of Lords and gave her assent to on the 6th of March.

The articles of union, as embodied in this act (stat. 6 Ann., c. 11, or 5 and 6 Ann., c. 8, in the common printed editions) are twenty-five in number. The 1st declares the two kingdoms of England and Scotland to be for ever united into one kingdom by the name of Great Britain, from 1st May, 1707. The 2nd fixes the succession, in default of issue of her majesty, in the Princess Sophia and the heirs of her body being Protestants. [George I.] By the 3rd the United Kingdom is appointed to be represented in one and the same parliament, to be styled the Parliament of Great Britain. The 4th gives to all subjects of the United Kingdom full freedom and intercourse of trade and navigation to all places in the said kingdom and the plantations, and a communication of all other rights, privileges, and advantages belonging to the subjects of either kingdom. The next 13 articles relate severally to shipping, regulations of trade, excise, salt duties, &c., the land tax, stamp duties, duties on windows, duties on coals, the malt duty, the proportion of other duties to be charged on Scotland, further provisions on proportion of charges and application of revenue, the assimilation of the Scottish coin in standard and value to that of England, and the introduction of the English weights and measures into Scotland. The 18th article provides that all laws in use in Scotland, not repealed by the treaty, shall remain of the same force as before, but alterable by the parliament of Great Britain, with this difference, 'that the laws which concern public right, policy, and civil government may be made the same throughout the whole United Kingdom; but that no alteration be made in laws which concern private right, except for evident utility of the subjects within Scotland.' The 19th article enacts the continuance of the courts of session and justiciary, the admiralty jurisdictions, and other courts of Scotland; provides for the establishment of a court of exchequer there; and authorises the crown to continue a Scottish privy council. The 20th article reserves to the owners all heritable offices and jurisdictions. The 21st guarantees the rights and privileges of the royal burghs. The 22nd regulates the representation of the Scotch peerage by sixteen lords of parliament, and of the shires and burghs by forty-five members of the House of Commons. The 23rd settles the privileges of the sixteen representative peers; and the 24th relates to the rank and precedency of the Lyon King of Arms, the great seal, the privy seal, and the preservation of the regalia and public records of Scotland, which it is declared shall continue to be kept in Scotland in all time coming. The 25th, finally, enacts that all laws of either kingdom, contrary to or inconsistent with the terms of these articles, shall cease and become void. The statute also embodies and ratifies an act passed at the same time with the articles, by the Scottish parliament, establishing and confirming the Protestant religion, the Westminster Confession of Faith, and the Scottish church and its Presbyterian church government and discipline by kirk sessions, presbyteries, provincial synods, and general assemblies, as the only government of the church within the kingdom of Scotland, and providing that the universities and colleges of St. Andrew's, Glasgow, Aberdeen, and Edinburgh shall in like manner continue for ever, and that no person shall be admitted to bear office in any of them without subscribing the said Confession, as the confession of their faith; a similar act for the security of the church of England passed in the present session by the English parliament; and another act passed by the Scottish parliament for settling the election of the sixteen peers and the forty-five members for Scotland.

SCOTO'PHILUS. [Owls.]

SCOTORNIS. [Night Jars, vol. xvi., p. 228.]

SCOTT, DANIEL. [Stephens, H.]

SCOTT, SIR MICHAEL, was born in Scotland, in the early part of the thirteenth century. If he really was, as has been assumed, Scott of Balweary, he succeeded in right of his mother, who was the daughter and heiress of Sir Richard Balweary of that ilk (as it is phrased), to that estate, which is in the parish of Kirkaldy, in Fifeshire, and is now, we believe, the property of ——— Fergusson, Esq., of Raith. An antient tower in ruins still exists on it, or did exist not many years ago.

The literary reputation both of Sir Michael Scott and of his contemporary Thomas Learmont (the Rhymer) may be taken as affording a presumption, which other circumstances go to corroborate, that Scotland in the thirteenth century was by no means in the benighted state commonly supposed. In fact there is reason to believe that during the peaceful and prosperous reign of Alexander III., which terminated in 1286, the dawn of civilization in the northern part of our island made a nearer approach to the more advanced light of arts and letters in England than was generally maintained in the subsequent progress of the two countries. Scott however probably studied at some foreign university, either Oxford or Paris. He is said to have gone to France in early life, and to have spent some years in that country; after which he proceeded to the court of the emperor Frederic II., who, possessed of remarkable literary acquirements himself, was then the great patron of learned men. If he did not however remain in Germany after the death of Frederic, which took place in 1250, he must have been still only in early manhood when he left that country—most probably at least under thirty,—since, as we shall find, he was employed in public duties scarcely suited to a person in very advanced age forty years after this date. If he passed some years, as is asserted, at the court of Frederic, he could not well have been much more than twenty when he first presented himself to or was sent for by the Emperor. Dempster indeed states that he was but a young man when he was writing books at the request of Frederic, 'cujus rogatu hic etiam juvenis multa opera scribere est agressus.' Yet Dempster was not aware that he was Scott of Balweary · he tells us indeed that his name *Scotus* was not that of his family, but of his nation. Is it possible that the Michael Scott of Balweary, whom we find living in Scotland, and actively engaged in the public service, in 1290, may be mistakenly assumed to have been the learned person of that name who resided at the court of Frederic II.?

They tell us, too, that upon leaving Germany, Scott came to England, where he was received into great favour by Edward I. But Edward did not become king of England till 1272, twenty-two years after the death of the learned Scotsman's German patron. Some account of what Michael was about during this long interval is therefore a desideratum.

From England he is said to have returned to his native country, though when is not precisely noted. For the rest, all that is known is that a Michael Scott of Balweary, who is spoken of by Hector Bocce as the famous scholar of that name, was one of the two ambassadors (Sir Michael de Wemyss, another Fife baron, was the other) sent to Norway by the estates of Scotland, in 1290, to bring home the infant heiress of the throne (Margaret, called the Maiden of Norway, daughter of the Norwegian king Eric).

The common account is, that Sir Michael Scott died in Scotland in the following year, 1291. Dempster says, 'Vixit usque in ultimam senectutem, et attigit annum MCCXCI., quo obiisse certum.' But Sir Robert Sibbald, in his 'History of Fife and Kinross,'—after telling us that, 'in testimony of this honourable commission and embassy' in which the two 'equites Fifani illustres, et summae prudentiae apud suos illis temporibus habiti,' as Buchanan describes them, were employed, 'there is still preserved in the house of Wemyss a silver basin of an antique fashion, which David [Michael?] de Wemyss got from the king of Norway at that time'—adds: 'And there is an indenture betwixt Sir Michael Wemyss de eodem miles, and Sir Michael Scott of Balweary, miles, in praesentia Joannis Balioli regis, apud Monasterium de Lundoris, anno 1294.'

(Edit. of 1802, p. 326.) We suspect there is no evidence for the death of Sir Michael Scott in 1291, at all to be compared with this evidence of the existence of a person of the same name and designation three years later. But in another place (p. 316) Sibbald asserts that the same Scott who was sent to Norway in 1290, went on a second embassy to that country to demand the cession of the Orcades, in the fifth year of Robert I., that is to say, in the year 1310. If this statement be correct, it is in the highest degree improbable that Michael Scott the ambassador could have been the person of the same name who figured as a distinguished literary character at the court of Frederic II. more than sixty years before. It is more likely that the one was the son of the other.

The real or supposed literary works of Sir Michael Scott are the following:—

1, 'A History of Animals,' in Latin; according to some authorities, a translation from the Arabic of Avicenna. But of this we know nothing. Dr. George Mackenzie, Scott's most elaborate biographer, says that the work exists 'in fol. editionis neque tempore neque loco expressis.' Dempster mentions 'Abbreviationes Avicennæ' in one book, and also 'De Animalibus ad Cæsarem' (*i.e.* Frederic), in one book.

2, 'Aristotelis Opera, Latine versa, partim e Graeco, partim Arabico, per viros lectos et in utriusque linguæ prolatione peritos, jussu Imperatoris Frederici II,' fol., Venet., 1496. The common accounts make Scott to have been the sole author of this translation; but it proclaims itself, as we see, to be the work of several hands. Possibly Scott may have contributed the translation of the Natural History, and may have done it from the Arabic, which may be all the foundation for the assignment to him of the version of Avicenna. Warton, speaking of the new translations of Aristotle from the original Greek into Latin, made about the twelfth century, says, 'I believe the translators understood very little Greek. Our countryman, Michael Scotus, was one of the first of them, who was assisted by Andrew, a Jew. Michael was astrologer to Frederic, emperor of Germany, and appears to have executed his translations at Toledo in Spain, about the year 1220. These new versions were perhaps little more than corrections from those of the early Arabians, made under the inspection of the learned Spanish Saracens.' (*Note to Dissert. on Introd. of Learning into England*, in *Hist. of English Poetry.*)

3, 'De Procreatione, et Hominis Phisionomia, Opus.' There is a copy of the first edition of this tract in the King's Library at the British Museum, printed, without the name of the place, in 1477; and in the general library of the museum are other editions, with the title slightly varied, printed in 1480 and 1487; and some, both in 4to. and 12mo., without date, and possibly still older. It is also the same work which was printed, with the title of 'De Secretis Naturæ,' at Strasburg in 1607, and at Frankfort in 1615, in 16mo., and with the works of Albertus Magnus, at Amsterdam, in 1655, 1660, &c., in 12mo. Bayle had an Italian translation of it, an octavo pamphlet of seven leaves, printed at Venice in 1533, with the title 'Physionomia, laqual compilo Maestro Michael Scotto, à prieghi di Federico Romano Imperatore, huomo di gran scienza; e è cosa molte notabile, e da tener secreta, pero che l'è di grande efficacia, e comprende cose secrete della natura, bastanti ad ogni astrologo; e è diviso in tre parti.'

4, 'Mensa Philosophica, seu Enchiridion, in quo de quæstionibus mensalibus, et variis ac jucundis hominum congressibus, agitur,' Franc., 12mo., 1602; 8vo., 1608; Lips., 24mo., 1603. There is an English translation of this treatise (which Tiedemann, in his 'Esprit de la Philosophie Speculative,' says contains some curious things), entitled 'The Philosopher's Banquet,' done into English by W. B., 3rd edit., enlarged, 12mo., London, 1633.

5, 'Quæstio Curiosa de Natura Solis et Lunæ.' This is a chemical treatise upon the transmutation of gold and silver, and is printed in the 5th vol. of the 'Theatrum Chimicum,' 8vo., Strassburg, 1622.

6, 'Eximii atque excellentissimi physicorum motuum cursusque syderii investigatoris, Mich. Scotti, super autor. Sphærar., cum quæstionibus diligenter emendatis, incipit expositio perfecta, illustrissimi Imperatoris D. D. Frederici precibus.' This is a commentary upon the celebrated treatise of Sacrobosco 'De Sphæra,' but is a mere compilation, and is believed to be falsely attributed to Scott. Dempster, after his fashion, enumerates a long list of additional titles, which it is quite unnecessary to transcribe.

But Michael Scott's chief reputation after his death, if not in his lifetime, was as a great magician. 'De quo,' says Dempster, writing in the beginning of the seventeenth century, 'innumerabiles etiam nunc hodie aniles fabulæ circumferuntur, nec ullum apud nostrates clarius nomen.' Even to this day he is traditionally remembered in that character in his own country; and various legends of his wondrous performances are still told, and half believed, among the peasantry, some of which may be found collected in the notes to Sir Walter Scott's 'Lay of the Last Minstrel,' in which poem the opening of the wizard's grave in the abbey of Melrose, and the taking from the dead man's cold hand of his 'book of might,' make so striking an incident. Dempster says, 'Ut puto, in Scotia libri ipsius dicebantur me puero extare, sed sine horrore quodam non posse attingi, ob malorum dæmonum præstigias, quæ illis apertis fiebant.' But in earlier times the fame of his magic skill was spread over Europe. Dante has introduced him in his 'Inferno:'—

'Quell' altro, che ne' fianchi è così poco,
Michele Scotto fu, che veramente
Delle magiche frode seppe il giuoco.'
(Canto xx., v. 117.)

and he is also mentioned by Boccaccio and other early Italian writers. He is severely arraigned by John Picus (Mirandula), in his work against astrology; and is defended from such charges, as well as Picus himself, in Naudé's 'Apologie pour les grands personnages faussement accusés de Magie.'

The Scottish tradition, as we have seen, is, that Michael Scott was buried in his own country, at Melrose. Another account however makes him to have died, and his remains to have been interred, in the abbey of Ulme or Holme Cultram, in Cumberland; and here also, it is pretended, his magic books were preserved. Satchells, in his rhymed 'History of the Right Honourable Name of Scott,' affirms that he got his account of the origin of that name out of an extract from one of Michael Scott's works which a person showed him at Burgh-under-Bowness, in Cumberland, in the year 1629. His informant told him, he says, that the book from which the passage was taken was never yet read through, and never would be; young scholars had only picked out something from the contents, but none dared to read the body of the work. And he adds,

'He carried me along the castle then,
And showed his written book hanging on an iron pin
His writing pen did seem to me to be
Of hardened metal, like steel, or accumie:
The volume of it did seem so large to me
As the Book of Martyrs and Turk's Historie.
Then in the church he let me see
A stone where Mr. Michael Scott did lie;' &c. &c.

This has been taken for a piece of poetic invention of Satchells; but we may observe that Camden, in his 'Britannia,' tells us that the magic books of Michael Scott were in his time still said to be preserved at Ulme, though they were then mouldering to dust. It is probable from this that they had been in the habit of showing at that place some antient volumes which they called Scott's magic writings. Camden adds, 'He was a monk of this place about the year 1290, and applied himself so closely to the mathematics and other abstruse parts of learning, that he was generally looked on as a conjuror; and a vain credulous humour has handed down I know not what miracles done by him.'

The present representative of the antient family of the Scotts of Balweary is said to be Sir William Scott of Ancrum (in Roxburghshire), Bart. (Douglas's *Baronage of Scotland*, ed. 1798, pp. 302 *et seq.*)

(The two chief authorities for the biography of Michael Scott are Dempster, 'Historia Ecclesiastica Scotorum,' which is full of lies; and Dr. Mackenzie's 'Lives of the Scottish Writers,' a compilation of the beginning of the last century, abounding also in apocryphal matter, and destitute of anything like critical spirit. Mackenzie's notice extends to eighteen folio pages, but of these thirteen are occupied with an account of the writings of Aristotle, translated from the 'Œuvres Diverses' of the Père Rapin, and above four more with equally irrelevant matter. There is a short article on Scott in Bayle; and one of more detail, to which we have been indebted for several facts respecting his writings, in the 'Biographie Universelle.')

SCOTT, WALTER, was born in Edinburgh, on the 15th of August, 1771. He died at Abbotsford, on the 21st of September, 1832. The sixty-one years of his life were filled y the incessant labours of a strong and restless mind. which in the latter half of its career fixed upon its own efforts no small share of public attention, during one of the most exciting periods of European history. How much of the European fame of Scott has been a consequence of genuine poetical power, and likely to endure; how much of it has been the result of accidental circumstances, and sure to die away, it is yet too early to decide. The contemporaries of a man of genius are no more able to estimate his intellectual stature and proportions aright, than the man who stands close under the wall of Westminster Abbey would be to decide upon its architectural merits. All that can yet be done is to allow facts to speak for themselves, and to recommend a sincere opinion to a candid acceptation.

Scott's first appearance in print was in the year 1796, when, as he himself playfully says, he was 'prevailed on by the request of friends to indulge his own vanity by publishing the translations of Bürger's "Leonora" and the "Wild Huntsman" in a thin quarto.' This event is of no further importance than as it marks the termination of his probationary career—his course of hard study, with vague aspirations after some mode of turning it to account. The simple act of printing a couple of translations from no very eminent poet, had with him, as an equally unimportant act has with many others, decided his fate. The die was cast: from that moment he was an author for life.

The history of his early boyhood is the tale of a naturally strong constitution struggling with disease. He had attained his twenty-second month, and could already walk tolerably well for a child of his age, when the girl who took care of him was awakened one morning by his screams, and on examination found his right leg powerless and cold as marble. Medical aid was vain; he was lame for life; and during upwards of two years, the previously healthy boy continued a pining child. In his fifth year, his parents thought him sufficiently recovered to trust him first to the charge of his grandfather at Sandy Knowe on the Tweed, and afterwards to that of a maiden aunt, who carried him to Bath. The boy had attained his eighth year before he was deemed strong enough to be sent to the high school of Edinburgh. While attending this seminary, and during the first winter of his attendance at college (1784), he enjoyed tolerably good health, and was able, notwithstanding his lameness, to join in most of the sports of his class-fellows. Towards the close of the year 1784 he had a violent attack of sickness, for the only distinct account of which we are indebted to himself:—'My indisposition arose in part at least from my having broken a blood-vessel; and motion and speech were for a long time pronounced positively dangerous. For several weeks I was confined strictly to my bed, during which time I was not allowed to speak above a whisper, to eat more than a spoonful or two of boiled rice, or to have more covering than a counterpane.' In May, 1786, he was sufficiently recovered to commence his apprenticeship as writer to the signet, at that time the usual commencement of the education of Scotch barristers; and his subsequent life was little troubled with indisposition.

These juvenile sicknesses had a powerful influence upon the development of his mental powers. The aunt to whose care he was entrusted when a mere boy, possessed an immense store of legendary tales, which were frequently put in requisition for the amusement of the invalid. During the confinement of his second attack he was allowed to devour the contents of a circulating library, founded, it is believed, by Allan Ramsay, rich in 'the romances of chivalry and the ponderous folios of Cyrus and Cassandra, down to the most approved works of modern times.' Scott has declared, 'I believe I read almost all the romances, old plays, and epic poetry in that formidable collection.' The child's love of stories was thus ripened into an ill-regulated fondness for books: the practice of reading, to which he was drawn by inability to do anything else, created a craving for that pleasure, and the constant succession of new books rendered unnecessary the exercise of attention required to extract a new pleasure on reperusal. His mind was accustomed to find pleasure in yielding passively to a succession of new images. Those ideas remained impressed on his memory which most roused his emotions; and he contracted unconsciously the habit of grouping them in conformity to that law of association which links events following or seeming to arise out of each other in the progress of an adventure. His mind even at that early age was developing the talents of the story-teller, and, as in the cases of Göthe and Richardson, the precocious command of language, giving voice and form to the stories which his imagination constructed, showed itself in the pleasure he found in inventing and telling tales for the amusement of his companions.

The society around him was favourable to the nourishment of such tendencies. His father was a strict disciplinarian, a precision in religion, and a legal formalist. He exacted from his children a strict observance of the outward forms of religion, and spared no trouble to imbue their minds with a knowledge of the doctrines of the national church. He strove to make the actions of his domestic circle as strictly conformable to rules as his causes in the Court of Session. The strong hand of discipline like this only serves to make children more intent upon the stolen enjoyment of their favourite amusements. Walter read with more avidity what his father scorned as trifling reading, and hung on the lips of every one who could gratify him with legendary tales. He was surrounded too by characters calculated to leave a deep impression on the mind of a bookish boy. The Lowlands of Scotland had by that time settled down into the same regulated habits of steady industry that still characterize them; but many old-world characters belonging to a less tranquil period were still surviving. George Constable, of Wallace Craigie, near Dundee, who sat for his picture in the 'Antiquary;' Mrs. Anne Murray Keith, the Mrs. Bethune Babel of the 'Chronicles of the Canongate;' Mrs. Margaret Swinton, who figures in the introduction to 'My Aunt Margaret's Mirror;' Alexander Stewart, of Invernahyle, a Highland gentleman, who had been 'out in the forty-five,' by their appearance and conversation carried the boy's imagination back to a state of society which had ceased to exist, and formed a connecting link between the real world in which he lived and the imaginary world which he found in his romances. He had opportunities too of observing closely the manners and feelings of the lower classes of society in the agricultural districts of the south of Scotland. His grandfather, being a farmer, lived on a footing of more familiar intercourse with his domestics than was even then customary in towns, and in his house Scott learned the pass-word to the confidence of that class. As he grew in years and in strength, he was encouraged by his family, probably with a view to confirm his health, to take long rambles on foot and on horseback through the border and highland counties where his father had relations or clients.

The impressions thus derived might have faded even from a retentive memory in the busy period of confirmed manhood; but a direction had been given to his awakening intellect, which led him to brood over and cherish them. On one of his visits to a paternal uncle, who resided in the environs of Kelso, he became acquainted with the collections of the bishop of Dromore. 'In early youth,' he says, in the 'Essay on Imitations of the Antient Ballad,' prefixed to the third volume of the 'Minstrelsy of the Scottish Border,' 'I had been an eager student of ballad poetry, and the tree is still in my recollection, beneath which I lay and first entered upon the enchanting perusal of Percy's 'Reliques of Antient Poetry,' although it has long perished in the general blight which affected the whole race of oriental platanus to which it belonged.' The perusal of this work led him on to the kindred publications of Herd and Evans. Herd's book was an attempt to do for Scottish what the bishop had accomplished for English traditional song. In Evans's work some poems of modern date were intermingled with the old ballads, and among others 'Cumner Hall' by Mickle, adverted to in the notes which Scott appended to 'Kenilworth,' in Cadell's collective edition of his novels. The hot controversy which arose between Percy and Ritson led the amateurs of old ballad poetry to plunge more deeply than they contemplated into philological and antiquarian discussions. The effects of this upon Scott may be conjectured from the subjects of one essay composed as a class exercise during his attendance on the moral philosophy lectures of Dugald Stewart in 1790, and three which he read in the years 1792-3 in the Speculative Society. They are, 'On the Manners and Customs of the Northern Nations of Europe,' 'On the Origin of the Feudal System,' 'On the Origin of the Scandinavian Mythology,' and 'On the Authenticity of "Ossian's Poems."' The topics which at that time engrossed the attention of his young contemporaries (among whom were the future founders of the 'Edinburgh Review') were practical, economical, and political dissensions. Scott however held on his own way: his favourite themes were the old world, the bent of his mind was historical.

Like most young men addicted to literary pursuits, he had at an early age tried his hand at rhyme. His ballad studies kept alive the inclination. Burns, whom he saw at the house of Professor Ferguson in 1786-7, seems to have made a lasting impression upon him, both by his writings and his personal appearance. For ten years however his rhyming propensities remained in abeyance, till they were re-awakened by the popularity earned by the ballads of Monk Lewis. Scott's attention had been directed to German literature by a very superficial essay on 'The German Theatre,' read by Henry Mackenzie at a meeting of the Royal Society of Edinburgh in 1788. Scott and several of his companions formed a class, soon after the publication of that paper, for the purpose of studying the German language; but these studies were followed up in a rather desultory manner till the year 1793 or 1794, when Miss Aiken (Mrs. Barbauld) directed his attention to the works of Bürger. He had some difficulty in procuring them; and had already met the young lion of the day, Lewis, and been stimulated, by his conviction of his own superiority in general information, to attempt an appeal to the public, when an edition of Bürger, which a friend had procured for him from Hamburg, came into his hands. The consequence was the publication of 'William and Helen,' in 1796, which has been already alluded to.

It is necessary that we advert to Scott's more active pursuits before closing this retrospect of his probationary years. He was apprenticed to his father in May, 1786. He never however acted regularly as clerk. His absences on jaunts to the Highlands and the border counties were long and frequent; and a gentleman who was in Mr. Scott's office during the period of Walter's nominal apprenticeship, assured us that his time while there was mostly spent in playing chess. In 1791, having finally resolved to adopt the profession of advocate, he recommenced his attendance upon the college classes, interrupted by his illness, and joined the Speculative Society. In 1791 he petitioned and was admitted by the Faculty of Advocates to his first trials; in 1792 he passed the rest, and was called to the bar. As a member of the Speculative Society and the faculty, he took an active part in the private business of both bodies. In the civil court, he has told us, his employment did not exceed one opportunity of appearing as the prototype of Peter Publio. But in the Court of Justiciary he made several appearances, in all of which he distinguished himself by diligent preparation. His conduct at this period was marked by an anxious desire to force himself into professional employment, and by that energy which promised success, could he but succeed in making a beginning.

We have now brought the subject of our narrative to the commencement of that literary career which he prosecuted with unabated perseverance till his death. The story of his literary life naturally divides itself into three epochs: that during which he was achieving his poetical fame, extending from the publication of his translation of Bürger in 1796 to the publication of 'Waverley' in 1814; the period of the celebrity of his novels, during which they followed each other in brilliant and rapid succession from the publication of 'Waverley' till the bankruptcy of Constable in 1826; the period of his Herculean struggle to re-adjust his affairs, shattered by the convulsion of 1826, till he sunk over-tasked into a premature grave in 1832. It is in every case difficult, perhaps inexpedient, to separate the part from the man: in the case of Scott it is impossible. We proceed therefore briefly, as our limits command, to trace, for each of the three periods we have enumerated, an outline of his actual life and circumstances, and of the literary works produced under their influence.

Unaware of the extent to which he had become involved in the literary career, he continued for some time his professional efforts. He was engaged as counsel for the defendants in several of the prosecutions for riots, seditious practices, and other offences arising out of the political ferment of the day. It has been imagined that the active part which his political zeal induced him to take in organising and disciplining the volunteer corps of horse formed in Edinburgh, contributed to mar his professional prospects. It certainly distracted his attention from legal studies, but it accelerated rather than retarded his promotion. In December, 1799, he was appointed sheriff of Selkirkshire; in 1866 he was appointed one of the principal clerks of the Court of Session. The duties of these offices, even when discharged by the same individual, left a large proportion of his time at his own disposal. The first mentioned ensured to him a small competency; the other was ultimately a lucrative appointment, although the arrangement he made with his predecessor in office prevented his deriving the full emolument from it till 1812. In addition to these sources of income he succeeded to a small landed property on the death of an uncle in 1797, and received a moderate fortune with Miss Carpenter, whom he married towards the close of the same year. He was thus placed above absolute dependence upon the literary exertions to which his inclination and leisure invited him. At the same time his relish for the elegant luxuries of life and the ambition to mingle on a feeling of equality with the families of the aristocracy, upon some of whom, as well as upon the honest farmers above alluded to, he had a claim of relationship—an ambition strengthened by this fondness for the legends of chivalry operating on an imaginative disposition, rendered further additions to his fortune not indifferent to him. It is questionable whether even this stimulus could have nerved him to perseverance in the dry drudgery of the law, but his active and energetic disposition courted labour so long as it did not impose any restraint upon the rambling desultory habits of thought acquired during the days of incessant reading of his sickly boyhood.

Even before he formed his final resolution to use literature 'as a staff—not as a crutch,' he followed up the appeal made to the public by the printing of 'William and Helen.' In 1799 he published a translation of Göthe's 'Götz of Berlichingen.' He composed and circulated among his friends the ballads of 'Glenfinlas' and 'The Eve of St. John.' In 1799 he received a visit from Mr. (now Sir John) Stoddart, who repeated to him many then unpublished poems of his friends Wordsworth, Coleridge, and Southey, and inspired him with a relish for their peculiar beauties. An intimacy which Scott formed with Mr. Heber, on the occasion of that gentleman's residence in Edinburgh during the winter of 1799-1800, confirmed his antiquarian tastes and extended his acquaintance with old English literature: he advanced from the school of the old ballad into that of the Elizabethan drama. The bustling patronage of Lewis had made Scott's name familiar to many persons of literary taste in England, and his acquaintance with the literati of Edinburgh became more extensive and intimate. About the beginning of the present century he paid several visits to Teviotdale, a district even less visited at that period than the Highlands, and in the course of these excursions he not only added considerably to his stores of traditionary song, but, what was of more consequence, learned to know that stalwart race whom he afterwards portrayed with such graphic power in 'Guy Mannering.'

We have now reached the period of his life at which he took his final plunge into literary occupation and avowedly commenced author by profession. His first publication in this capacity was his 'Border Minstrelsy,' a work which afforded him an opportunity of exercising his talent in various departments and showing the magnitude of his store of heterogeneous and not very well assorted knowledge. In his introductions he showed his talents as an essayist; in his notes, his research and critical acumen as an antiquarian; in the imitations of the old ballad, his taste and talent for poetical composition. 'The Border Minstrelsy' is indeed little more than the accumulated materials out of which he hewed the best of his later works—a chaos through which the fragmentary lights of creative imagination were everywhere sparkling. The book is scarcely less interesting, when viewed as the commencement of his connection with those commercial speculations in literature which ultimately broke down and crushed him, than as his first serious effort in the character of an author. Mr. James Ballantyne was, at the time of the publication of the 'Border Minstrelsy,' the editor of a provincial newspaper in Kelso. To him Scott offered the printing of his book. The offer, after some hesitation, was accepted, a new fount of types, superior to anything previously seen in Scotland, was procured, and under the direction of the principal workman on Mr. Ballantyne's establishment, who had been some time in the employment of Bensley, a specimen of typography was produced, which at once established the reputation of what was for a time rather affectedly called the 'border press.' Not long after Mr. Ballantyne removed to Edinburgh, and commenced printer on a large scale, in partnership, as has been proved by subsequent disclosures, with Scott. To this part of Scott's history we shall have occasion to return hereafter.

Scott commenced his career as the most popular poet of his day, in 1805, with the publication of 'The Lay of the Last Minstrel.' This poem was followed in 1808 by 'Marmion;' in 1809, by 'The Lady of the Lake;' in 1811, by 'Don Roderick;' in 1813, by 'Rokeby;' in 1814, by 'The Lord of the Isles.' To these may be added 'The Bridal of Triermain' and 'Harold the Dauntless,' published anonymously, the former in 1814, the latter in 1816. These poems took the literary world by surprise; they were unlike anything that had preceded them. There was an easy flow in their frequently slovenly versification, a condensed energy of thought, which even the total neglect of the *limæ labor* could not entirely conceal or obliterate; a pithy shrewdness in the occasional remarks upon life and manners; enough of the wild recondite spirit which the author had caught from Coleridge to lend a zest to his composition; enough of the leaven of common-place to render it intelligible to the mass of readers; and an entirely new class of heroes and adventures. Much of the popularity which attached to Scott's poems was owing to the novelty of their subjects, and much to his compliance with the taste of the times; but his strong native sense, the stores of out-of-the-way knowledge upon which he could draw, and the easy flow of his versification and imagery, rendered them also works of real intrinsic merit. As the first gloss of novelty wore off, the voice of criticism was more distinctly heard. Lord Byron's more exaggerated tone of sentiment and greater power of condensed rythmical declamation made a deeper impression upon the public mind, and caused Scott's works to appear comparatively feeble by the force of contrast. The imitators too, who had caught the outward form of Scott's versification, and found plenty of heroes in old *fabliaux* and romances, had for a time surfeited the public with his peculiar style of poetical composition. With a prudent caution, said to be characteristic of his nation, he prepared to exchange a field of literary exertion in which he found himself in danger of losing his popularity, and after the failure of two anonymous trials ('The Bridal of Triermain,' and 'Harold the Dauntless'), never attempted to re-enter it.

Some time previous to his abdication of the laurel, the success of Miss Edgeworth's 'Pictures of Irish Life,' and his consciousness of an extensive acquaintance with the manners and customs of Scotland, more especially of the olden time, had stimulated him to attempt a portraiture of them in a prose imaginative narrative. The task was prosecuted for some time, but in consequence of the unfavourable opinion of a friend, laid aside. In 1814 however he resolved to make the attempt, and 'Waverley' was published anonymously. This book, published without any parade of announcement, and without the attraction of an author's name, made its way noiselessly and rapidly to a high place in public estimation. In the course of four years it was followed in rapid succession by 'Guy Mannering,' 'The Antiquary,' 'The Black Dwarf,' 'Old Mortality,' 'Rob Roy,' and 'The Heart of Mid Lothian,' all bearing the indisputable impress of the same parent mind. The circumstance of Scott's having published a poem in the same year in which 'Waverley' appeared, and his engagement in other literary undertakings being known, combined, with the common prejudice that a poet cannot excel as a prose writer, to avert from him for a time the suspicion of the authorship of the 'Waverley' novels. The taciturnity of the few entrusted with the secret defeated all attempts to obtain direct evidence as to who was the author. From the first however suspicion pointed strongly towards Scott, and so many circumstances tended to strengthen it, that the disclosures from Constable's and Ballantyne's books, and his own confession, scarcely increased the moral conviction which had long prevailed, that he was the 'great Unknown.'

The light half-playfully worn veil of mystery served however, no doubt, to excite the public curiosity and to add a factitious interest to the 'Waverley' novels at the time of their publication. But their own merits were doubtless the main cause of their success. As narratives they have little merit: the plot is uniformly inartificial and unskilfully wrought up; the ostensible heroes and heroines, insipid or unnatural. It is in the admirable Scotch characters, in the ease and truth of their actions and conversation, that the charm of these novels consists. There is a power and depth in the characters themselves: they had been originally conceived with the intense love of a strong mind; they had remained stored up in its memory for years, mellowing in tone and growing more distinct in form, and were at last, accidentally we may almost say, poured out with a felicity and strength of expression of which the author was himself scarcely aware that he was capable. This new vein of popular applause was worked as sedulously as the former, and, like it, worked out. The novels which from 1818 to 1826 followed those we have enumerated in rapid succession, are not, like them, the outpouring of long-treasured thoughts; they bear marks of reading for the purpose of finding materials to fill up a previously sketched outline. They are of different degrees of merit, but all are inferior in depth of tone and weight of metal to the works of the first four years. Individual characters and incidents in some of them may be equal, but not one of them can bear comparison when considered as a whole.

Scott's novels and poems however occupied by no means the whole of his time during the thirty years of his busy life, of which they were the luxuriant produce. He contributed to the 'Edinburgh Review' at its commencement, and when differences of political opinion induced him to break off from that publication, he took a warm interest in the establishment of the 'Quarterly.' His trade connections with the Ballantynes, and through them with Constable and other publishers, led him to project many publications, and to take an active part in them as editor or contributor. To these we owe the 'Life of Dryden' (1808), of Swift (1814), the biographical and critical prefaces to Ballantyne's collection of the English novelists, and his annotations to such books as Sadler's 'Correspondence.' His biographical and critical writings are characterised by masculine good sense, vigour, and a happy play of humour, rather than by subtle analysis or a just and delicate taste.

From 1796 till 1826 Scott's life was busy and happy, and seemingly prosperous. By the patronage of friends he was rendered independent; by his own exertions he was raised to affluence. His notoriety as an author gave him an extensive circle of acquaintance. His manly and sensible character commanded respect, his *bonhommie* and talent for increasing the hilarity of the social hour conciliated the love of all who knew him. The continuance of apparent success increased his confidence in his own resources to a degree bordering on presumption. The ambition of his life was to enact the part of one of those feudal lords who were the favourite objects upon which his imagination dwelt. To this was owing the purchase and building of Abbotsford, the strewing of it with 'auld nick-nackets,' and the extensive scale on which he exercised his hospitality. He endeavoured to revive old times in his mansion on the Tweed. The last few years of his prosperity were spent in a gorgeous dream. The open-air day-light masquerade of the reception of George IV. in Edinburgh, in which Sir Walter Scott was a prominent actor, was the most gorgeous scene of what we can scarcely look upon in any other light than that of an opium dream. But the worm was gnawing at the root of his magnificence. Constable, Ballantyne, and Scott were all men of sense and talent, but the spirit of enterprise was stronger in them than that of accurate mercantile calculation. From the beginning their undertakings had been on a larger scale than their capital warranted; and as difficulties thickened around them their confident spirits looked for relief to bolder and more extensive speculations. This could not go on for ever: the commercial crisis of 1825-26 precipitated, but did not cause the catastrophe.

When what is called in Scotland 'a state of the affairs' of Constable and Co. and Ballantyne and Co. was made up subsequently to the bankruptcy of the two companies, it appeared that Sir Walter Scott was indebted to Constable's creditors, as a partner of Ballantyne and Co., for nearly 72,000*l.*; and that the total amount of the debts of Ballantyne and Co. was about 110,000*l.*, for the whole of which Sir Walter was liable as a partner. About half of the 72,000*l.* due to Constable and Co. being included in the debts of Ballantyne and Co., Scott's actual liabilities were somewhere about 147,000*l.* The presumptuous rashness with which, in order to indulge himself in the theatrical pleasure of enacting the part of one of the favourite heroes of his imagination, he incurred this immense load of debt, cannot be palliated. From 1823, if not from an earlier period, novels were contracted for and paid in bills, before even the subjects or names of the future publications were fixed. This was not a mere speculation upon popularity: it was a wanton setting of health, mental and corporeal, and of life itself, upon the hazard. But to the honour of Scott, he did not flinch from the terrible responsibility he had so presumptuously incurred. 'Gentlemen,' he said to the creditors, 'Time and I against any two. Let me take this good ally into my company, and I believe I shall be able to pay you every farthing.' He surrendered the whole of his property; executed a trust-deed in favour of certain gentlemen, who were to receive the funds realised by his labours, and pay off his debts with interest by instalments; sold his house and furniture, and retired to lodgings, and resumed his literary labours with dogged resolution. 'It is very hard,' he said, in his deep thoughtful voice, to a friend who expressed his sympathy, 'thus to lose all the labours of a lifetime, and be made a poor man at last, when I ought to have been otherwise. But if God grant me life and strength for a few years longer, I have no doubt that I shall redeem it all.'

Scott's works, published during the six years which elapsed between his bankruptcy and his death, which occurred on the 21st of September, 1832, possess a painful interest. They want the energy and buoyancy of his earlier writings; they bear the impress of the lassitude of a spirit engaged in a hopeless task. Some of them, like the 'History of Napoleon,' are works which lay out of his line; some of them, like the 'Letters on Demonology and Witchcraft,' are of a class to which humbler pens alone ought to be tasked; some of them, like the gossiping notes to his collected works, are concessions to the impertinent curiosity of the public, to which it is painful to see a great man stooping. Neither Walter Scott nor any other really great author ought to be his own Boswell. Making allowance for every drawback however, the old fire glows in his ashes. Nor was his self-immolation altogether in vain. There can be little doubt that the disease which proved fatal to him was superinduced by excess of mental toil, but the purpose for which he sacrificed himself was attained. His debts, materially diminished before his death have since been entirely liquidated by the profits of the edition of his collected works. The certainty of this event, the consciousness that he had not shrunk from the responsibilities he had incurred, the feeling that he had deserved and retained the love and respect which waited upon him in more prosperous days, was his consolation in the dark hours of his closing life. The political party to which he was devoted was overthrown, and the institutions he venerated were in his opinion about to be swept away; his wealth had melted from his grasp, toil was the lot and prospect of his old age, the friends of his youth were dying out one by one; but the consciousness of honourable and manly endurance, and the devoted love of his children, smoothed his passage to the grave. He sought, but too late, health in a foreign climate. The worn-out frame craved to be at home and at rest. He murmured, 'now he knew he was at Abbotsford,' when his friend Mr. Laidlow welcomed him on his return, and for a few days enjoyed the mansion he had reared with so much love and pride. His strong frame struggled hard with the disease, but exhausted nature gave way at last, and he expired after fourteen days of total insensibility

We observed at the commencement of this sketch that it is yet too early to attempt a dispassionate estimate of Scott and his writings. Making allowance for increased facilities of communication, and more generally diffused education, the fervour of popular enthusiasm with which his works were received was not greater than was experienced by the publications of Richardson. Time alone can decide how much of his writings will survive, and what place they will permanently occupy in the estimation of the literary world. Of this however there can be no doubt, that in Scott a strong and healthy intellect was engrafted on a powerful will, that he had a natural and easy play of humour, with no inconsiderable portion of poetical imagination, and a large share of that power of apprehending and portraying character which is the great charm of Fielding. Great part of his life he indulged in a dream world of his own; but when rudely awakened by adversity, he submitted to the consequences with heroic submission. He was a great and a good man

Walter Scott was the fourth of ten children, of whom only Thomas, a younger brother, left any descendants. His own children were, the present Sir Walter, Mrs. Lockhart and Miss Anne Scott (both of whom survived their father, but are since dead), and Mr. Charles Scott.

(Lockhart's *Life of Scott; Notes and Prefaces by Sir Walter to the edition of his Collected Works; Publications by the Trustees of the Messrs. Ballantyne; MS. Communications.*)

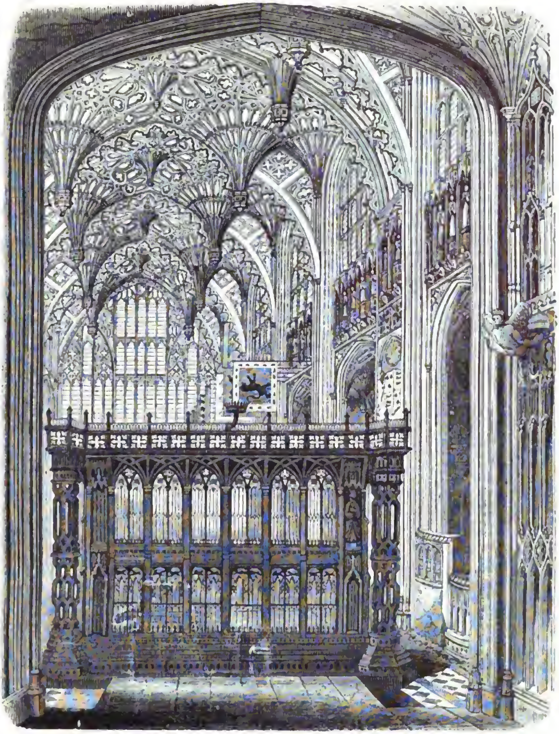
SCOTUS. [DUNS SCOTUS.]

SCREEN, in Architecture, a term probably connected with the Latin *Scrinium* and the German *Schrein*, signifies a partition dividing off some portion of an interior or room from the rest of its plan, without similarly contracting or shutting up the space over head, a screen being a partition carried up only to a certain height, so as to admit a view beyond it. Screens are exceedingly beautiful internal features in the Gothic or pointed style, in which they were employed for a variety of purposes, not in churches alone, but in halls and other buildings. Great diversity was also displayed in them as regards both design and material; for we meet with them sometimes solid or nearly so, at others almost entirely of open-work; of stone or of timber, and occasionally composed of both; but agreeing in one respect, namely, in being more or less elaborately decorated.

In our English cathedrals the choir is separated from the nave by the *organ screen*, which differs from others in being a double screen, so as to form the gallery for the organ above, and to admit of stairs leading up to it, in the space between two partitions. Though some prefer the continental mode, we are of opinion that the apparent extent of the vista is rather increased than not, by its being partially interrupted below, while the prospective is continued, and perhaps a view of a noble east window is caught in the remote distance.

The *altar screen* serves as a back wall to the choir, separating that division of the church from the presbytery or Lady-chapel behind it. It was therefore usually solid for the whole height to which it was carried up. That erected by Bishop Fox in Winchester cathedral is a splendid stone screen decorated with several tiers of canopied niches; and strikingly similar to it in design is the one by Abbot Whetehamstede at St. Alban's. Though not so designated, the stalls, &c. form lateral screens enclosing the lower part of the choir from the side aisles. Chartres cathedral contains a no less remarkable than fine example of such screen continued round the apsis of the choir, showing itself as a wall carried up to some height above the stalls, and divided into large compartments filled with sculpture. The fronts of chantries, small chapels, &c. in churches, may also be described as screens, the greater part of which is pierced in open-work and tracery. The examples of this class are so numerous, that to particularise any of them would be almost superfluous; nevertheless we may here mention that enclosing the monumental chapel of Prince Arthur, son of Henry VIII., in Worcester cathedral. The tomb of Henry VII., in his chapel at Westminster, is a very gorgeous piece of screen-work, executed entirely in metal, and forming an insulated shrine on a very large scale. Westminster Abbey itself contains many fine studies of screens in its chapels and chantries. Of timber screens separating the chancel and altar end from the body of the building, many specimens are to be met with in country churches, and not a few of them are worthy of being studied for the beauty of their design. In some instances, the lower part, or actual screen itself, is little more than a plain wooden partition surmounted by a range of open-work panels or arches. Of such screens there is a peculiar kind distinguished by the term of *rood-lofts* or *roodloft screens*, the top of them forming a kind of small overhanging gallery supported on corbels and brackets, and on which were placed the 'Holy Rood,' or large crucifix with a figure of the Saviour, and other images.

Screens of a different character, and for a different purpose from any of those above mentioned, were employed in the halls of domestic and collegiate buildings, for the purpose of cutting off a passage leading to the butteries and offices. Such screens were almost invariably of oak or other wood, and the space over them and the passage behind served as a music gallery. Open-work was very rarely if ever introduced into them, but they had generally two open arches, or sometimes square-headed doorways. Several specimens of this class of screens may be seen in Nash's 'Mansions of England in the Olden Times,' some of them, as that in the Hall at Audley-end, profusely adorned with



The Great Brass Screen which encloses the Altar Tomb of Henry VII. and his Queen in his Chapel at Westminster.

carved panelling and other sculpture; and the one just mentioned is further remarkable for the centre compartment being carried up higher than the rest, though not quite to the ceiling. Other instances occur where the screen is carried up two stories, so as to form either a passage on the chamber floor, or a closed gallery with glazed or latticed apertures. Of this kind are those in the halls at Knowle and at Hatfield. Of still more unusual character is the one at Wroxton Abbey, Oxfordshire, for there the screen, which has a series of small windows in it, is confined to the upper part of the hall, and is supported on an open colonnade below.

Screen is also employed to signify a colonnade or wall architecturally decorated, enclosing a court-yard in front of a building, as that for instance of the Admiralty, London, or the one which was erected before Carlton House, and which consisted of a single range of coupled Ionic columns placed on a lofty stylobate. Screens of this kind are sometimes had recourse to in order to connect the advancing parts of a plan together, and prevent a façade being cut up into gaps. It is by this means that the buildings forming the river front of Somerset House have been connected together into one continuous façade by screens assuming the appearance of open Corinthian loggios above spacious bridge-like arches. Eminently picturesque in themselves, those features serve greatly to relieve all the rest, and to prevent the monotony that would otherwise take place in so extended a front.

Of screens or low walls carried up midway between columns whose shafts are attached to them, there are frequent instances in Egyptian architecture, and they belong to the characteristic peculiarities of that style. [Egyptian Architecture, p. 314, 315.] Somewhat similar screens might occasionally be adopted with propriety and good effect, in the Grecian style also, either *behind* columns or *between* insulated square pillars. This has in fact been done behind the second range of columns in the recessed part of the portico of the Museum at Berlin, where a screen of the kind encloses the lower part of the staircase, while the ceiling, &c. are seen over it; whereby not only is the view continued, but light is obtained for the staircase, without windows. [Portico.] The article just referred to affords another instance of an inner screen within a portico, viz. that shown in *Fig.* 9; a valuable idea, susceptible of many variations and combinations, all of them more or less picturesque; for instance columns behind the screen, caryatides upon it, colossal *hermæ* forming pilasters on its surface, &c. In the interior of buildings again, let their style be what it may, architectural screens might be employed so as greatly to enhance effect, and at the same time to add very materially to convenience.

SCREW. This mechanical power generally consists of two parts, one of which is a solid cylinder of wood or metal, on whose convex surface is formed a projecting rib or fillet, frequently called a thread, which passes spirally round in such a manner as constantly to make equal angles with lines parallel to the axis of the cylinder. The other is a cylindrical perforation through a block of some material, the surface of the perforation having on it a spiral groove corresponding to the projecting rib or fillet on the solid cylinder. The first of these parts is called a convex screw, and the other a concave screw.

A just conception of the nature of the line of direction taken by the rib or groove on the surface of the cylinder, may be obtained by drawing on a rectangular paper, whose breadth AB is equal to the circumference of the cylinder, any number of lines AB, CD, EF, &c., equidistant from each other, and perpendicular to the sides of the paper. Then joining the points A and D, C and F, &c. by right lines, and bending the paper on the surface of the cylinder, the lines AD, CF, EH, &c., will, by uniting at their extremities, become the continuous *helix* or spiral curve-line which the thread assumes. When the two parts are in action, the convex screw, being turned round in the other by a power applied at its surface, moves at the same time rectilinearly in the direction of its axis: occasionally however the convex screw is fixed, and then the other being turned about, it acquires at the same time a like rectilinear motion. In either case, the path described by a point on any thread during the time that the screw turns once on its axis, on being developed, becomes equal to AD or CF; and in the same time a point on the axis moves through a space equal to BD or DF.

Fig. 1.

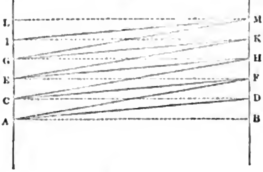
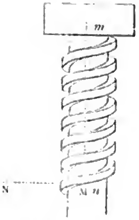


Fig. 2.



As a mechanical power, the screw possesses the properties of an inclined plane; for W representing a weight or pressure at one end of a convex screw, whose threads are thereby made to move in the grooves of the concave screw, let that weight be supposed to act in a direction parallel to the axis, and to be uniformly diffused among all the projecting threads which are at one time in the grooves; also let *p* be the part of the weight which presses in the direction *m*M on an elementary portion M*n* of the side of a groove in the concave screw. Then M*n* may be considered as a small inclined plane, making with *m*M an angle equal to ADB: and if *q* be a force which applied at M in the direction NM, touching a circle whose plane passes through the screw perpendicularly to the axis, would prevent the convex screw from turning round; the pressure on M*n* and the counteracting force will be in the same circumstances as the weight of any body on an inclined plane and a sustaining power which acts in a direction parallel to the base of a plane, and, by the resolution of forces, the ratio between the pressure and the force will be as the base of the plane is to its height; that is, as AB to BD. Now an equal force *q* will be in equilibrio with the pressure *p* on every other elementary portion of the grooves in the concave screw: therefore, there being as many forces $= q$ as there are pressures $= p$, the whole weight W on the screw will be to the whole sustaining force, in the case of equilibrium, as AB to BD; that is, as the circumference of the convex screw is to the distance between the threads when measured in a direction parallel to the axis.

But the screw, when applied as a mechanical power, is never used in its simple state; a lever or wheel is always fixed perpendicularly to the axis, and the moving or sustaining power is applied near the outer extremity of the lever, or at the circumference of the wheel. In this last case, the ratio between the moving-power and the resistance is as the distance between the threads of the screw is to the length of that circumference; and the velocity of a point on the axis is to that of a point on the circumference in the same ratio. The friction of a screw is however very great, and is frequently equal to, at least, the weight supported, for it will prevent that weight from descending when the moving-power is taken away.

An *endless* screw consists of two or more spiral fillets or threads on a rod which is capable of being turned on its axis by a power applied to the handle of a winch, or to a string passing over the circumference of a pulley attached to the rod. The threads work between teeth on the circumference of a wheel, so that while the revolution of the rod continues, the wheel turns on its own axis. If the radius of the winch or of the pulley on the screw-rod be 6 inches and the distance between the threads of the screw be $\frac{1}{10}$ inch, a power represented by unity at the circumference of the pulley will be in equilibrio, omitting the effects of friction, with a resistance expressed by $6 \times 10 \times 2\pi$, that is, by 376·99 (π being the half circumference of a circle whose radius is unity) applied at the threads of the screw or at the circumference of the wheel.

If the lines AF, CH, &c. were drawn on paper, and that paper were bent on the surface of a convex or concave cylinder, one spiral thread would be formed by the union of AF, EK, &c. at their extremities, and another by the like union of CH, GM, &c.: this is called a double-threaded screw, and it is evident that its mechanical power depends upon the ratio of AB to BF, while that of the single-threaded screw depends on the ratio of AB to BD; that is, with apparently an equal distance between the threads on both screws, the power of the latter is double that of the former.

From the high ratio which the resistance bears to the moving-power in the screw, the use of this machine for moving or compressing bodies is very great; it is also extensively employed in the construction of philosophical instruments for measuring small angles or distances. [MICROMETER.]

The ingenious screw-machine which was invented by Mr. Hunter, and is described in the 'Phil. Trans.' vol. 17, consists of one convex screw which works in the interior of another convex screw. The latter works in a concave screw which is fixed; and the former is capable of moving in a rectilinear direction only, being prevented from turning on its axis with the rotation of the exterior screw. Also the number of threads in an inch on the convex surface of the last is less by one than the number in an inch on the convex surface of the other: suppose the first number to be 10 and the other to be 11; then one revolution of the exterior screw would cause the whole machine to move forward through a space equal to $\frac{1}{10}$ inch, but in the same time the interior screw is carried backward through $\frac{1}{11}$ inch. Therefore the forward motion of this last is equal to $\frac{1}{10} - \frac{1}{11}$ or $\frac{1}{110}$ inch; and to produce an equal effect in a simple screw, the latter should have 110 threads in an inch.

Mr. Barlow of Woolwich mentions a compound machine of this kind in which the exterior screw had 100 threads in an inch, and the interior screw 101 threads; therefore one turn of the machine caused the latter to move through the very minute extent of $\frac{1}{10100}$ inch, and this space was further subdivided into hundredths by means of a micrometer head applied to the exterior screw.

The endless screw is a component part of graduating machines, counting machines, &c.; it is also employed in conjunction with a wheel and axle to raise heavy weights.

SCREW. The preceding article having explained the principle of the screw, it remains only to notice some of the contrivances used for making screws; which we shall commence by an account of the manufacture of those commonly used by carpenters for fastening pieces of wood, or of wood and metal together. These are, in this country, usually called *wood-screws*, and in Scotland *screw-nails*.

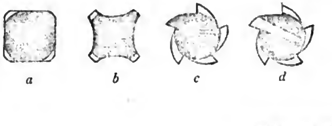
The blanks for wood-screws were formerly forged by the workmen who make nails, they being in fact very nearly the same as countersunk clout-nails, with the exception of their ends not being pointed. Some manufacturers make their blanks of round rolled iron, cut into the required lengths, and pinched when red-hot between a pair of dies in the chaps of a vice, while the heads are formed with a hammer, or the stamp of a fly-press. But it appears to be the best plan, at least for screws not exceeding about a quarter of an inch in diameter, to form the blanks of iron-wire, cut by a machine, and having the heads struck up in a die without the application of heat. After forming the head, the next process is filing or turning the necks and heads in a lathe; after which the nick, or groove to receive the end of the screw-driver, is cut with a circular saw. In the infancy of screw-making the thread was formed with a file, but this process has long been superseded by the use of dies and cutters, which are applied in various ways. The cutting of the worm is sometimes performed in a lathe, the blank being fixed in a chuck, and projected during its revolution between a pair of stationary cutters; the longitudinal motion of the blank, and consequently the size or inclination of the thread, being determined by a regulating or pattern screw attached to the mandril, which must therefore be changed for every different degree of fineness; while the shape of the thread or worm depends on the form and position of the cutters. Small screws are frequently wormed by a similar apparatus turned by a winch-handle attached to the mandril; and sometimes by means of a steel tap-plate. This method of forming the worm is that described in Hebert's 'Engineers' and Mechanics' Encyclopædia;' but another plan, originally introduced by Mr. Nettlefold, of Holborn, is now very commonly adopted. In this case the worm is formed by means of a pair of stationary cutting dies; between which the blank is projected by an apparatus which gives it an alternating rotatory motion. The dies themselves regulate the size of the thread, without the use of a pattern screw, and they must therefore be changed for every variety of screw. The peculiar motion of the blank resembles that of a bolt wormed by hand, as hereafter described.

The manufacture of wood-screws has been greatly improved by the exertions of the gentleman just alluded to, whose patent screws are far superior, in every respect, to those of the ordinary make; while, by the extensive application of machinery, they are produced at a price little exceeding that of the common imperfect article. Much attention is paid to the perfection of the worm in these screws. It is cut deeper than usual, and the thread is made nearly flat on the upper side, while the under side is considerably inclined; so that while the screw enters the wood more easily than those of the usual make, it offers much greater resistance to any force tending to tear it out. A very common defect in wood-screws is having the worm terminate in a rough thin shell, which frequently becomes bruised, and tears away the wood in such a manner as to leave very little hold for the screw. This defect is best remedied by making the point of the screw smooth and conical. The best wood-screws are made to taper slightly from the head downwards; and a further improvement, which we believe has been recently introduced by Mr. Nettlefold, consists in making the worm shallower towards the head than at the point, by which the screws are rendered less liable to be twisted in two at the upper part of the worm, when turned into hard wood with great force, as when a brace is used instead of the common screw-driver.

Several attempts have been made, and some appear to have been tolerably successful, to produce screws by *casting*. In the ordinary method of casting in sand, the chief obstacle in the way of casting screws consists in the difficulty of removing the pattern from the mould. Mr. Maullin, a manufacturer who obtained a patent in 1800 for a method of overcoming this difficulty, accomplished his object by an apparatus for *screwing* the patterns (of which a great number might be used together) out of the mould, so as to leave the impression of the thread uninjured. The details of this contrivance are given in the thirteenth volume of the 'Repertory of Arts.'

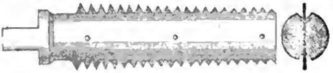
Screw-bolts and other screws for working in metal are manufactured in a similar manner to wood-screws, when the number required is sufficient to justify the expense of adjusting the machinery. When this is not the case, they are, if small, often cut by hand, without the aid of a lathe. The die, or instrument for cutting an external or male screw, resembles a common nut, but is usually divided into two parts, which are fitted, when in use, into an iron stock or die-frame, with long handles. Notches are cut in the die, across the direction of the threads, in order to produce cutting angles, and to afford room for the escape of the portions of metal removed in cutting the worm. The die, which is formed of steel, and well tempered, is inserted in the die-stock, with its two halves a little distance apart, but capable of being brought together by regulating screws fixed in the die-stock. The bolt or pin to be made into a screw is formed to the required size by turning or otherwise, and then made fast in a vice, while its end, which should be slightly tapered for the purpose, is placed in the die. The operator then proceeds to turn the die-stock so as to worm the die on to the bolt; not by a continuous motion in one direction, but by a series of turns backwards and forwards. When the die has proceeded as far on the bolt as the worm is required to extend, it is taken off, screwed up a little closer, and again applied in the same manner; and the process is repeated, closing the die a little after each operation, until the worm is cut to the required depth. The continuous motion of the die is impracticable, on account of the great resistance it has to overcome, as the worm is not formed merely by cutting away, but partly by compressing the metal, and squeezing it up into the thread. In working a similar apparatus by machinery, the dies are sometimes made in four pieces, the die-frame is stationary, and the bolt or screw-pin itself revolves. In this case the rotation is continuous, but in other respects the operation resembles that described. In the 'Mechanics' Magazine,' vol. xxv., p. 376, is published a description, with cuts, of a curious kind of die and die-stock invented by Mr. Tracey, in which the two halves of the die may be so varied in their relative position in the stock, that the same die will cut either a right-hand or left-hand screw, either single or double threaded. In cutting large screws, especially with a square thread, a steel cutter is sometimes used with the die, whether turned by hand or fixed in a lathe; and some instruments for cutting male screws in wood consist of a sharp steel cutter, fixed in a block, having a female screw; the wooden die, or rather nut, being used merely to regulate the motion of the cutter. Very small metal screws are cut by a steel tap-plate, wormed and notched in a similar manner to the dies above described, but having several holes varying slightly in size, the worm being formed progressively by using at each operation a smaller hole than at the preceding one.

Female or interior screws are commonly cut by means of a steel tap, which, in its most usual form, is simply a screw of which great part of the worm is removed by filing two, three, or four flat faces along its whole length, the angles left by this operation forming a series of obtuse cutters. The tap should be made somewhat conical, that it may enter the hole readily, and cut the worm by degrees. In some cases two taps are used, the first only of which is tapered. The head of the tap is squared, to fit into the middle of a long handle, by which it can be turned with considerable purchase; and it is worked to and fro, in a similar manner to the die for an external screw, the nut being held stationary. The taps for cutting screws in wood are commonly fluted on the sides, to make them cut the more readily, and to afford more room for the escape of the cuttings. The tap invented by Mr. Jones, and described in the forty-eighth volume of the 'Transactions' of the Society of Arts, answers the purpose of a tapering tap for commencing the screw, and a cylindrical one for completing it, the lower part being tapered, while the upper is left cylindrical. Mr. Jones recommended the fluting or notching of the tap in the form represented in section at *c* in the annexed figure,



a form evidently more adapted for cutting than either *a* or *b*, which are the more usual forms. As much unnecessary friction is caused by having many teeth in the tap of the full size, it is recommended to file down a portion of them, in some cases as many as two-thirds, so as to leave the fully projecting (and therefore cutting) teeth at greater intervals than are occasioned by the flutes or notches. In large taps of this kind a steel cutter may be inserted, as shown in the section *d*, at the commencement of the cylindrical portion of the tap; the cutter being made to project a little, so that the tap follows it without difficulty. Such cutters are not used in taps of less than an inch and a quarter diameter.

An ingenious kind of tap for cutting screws in wood is described in the French 'Manuel du Tourneur,' and in Gill's 'Technological Repository,' vol. xi., p. 42. That described and represented by Gill is for cutting a square-threaded screw, and consists of a hollow screw of steel, having a hole drilled obliquely from the front end of the thread to the hole in the centre of the tap. The edges of this oblique hole, being made sharp, cut their way through the wood when the tap is turned round, while the hole itself forms a channel by which the cuttings escape into the cavity in the centre. For cutting internal screws in wood, where great accuracy is not required, the tap invented by Mr. Siebe, and described in the forty-first volume of the 'Transactions' of the Society of Arts, is very convenient, as the same instrument will serve for cutting either right-hand or left-hand screws, according to the direction in which it is turned. This tap is represented in the following cut, and may be formed by turning a wooden screw of the size required, then cutting a longitudinal slit along its centre, and inserting a plate of steel of the length and breadth of the screw. While held in this position, the edges of the plate are filed into notches corresponding with the worm, after which it is removed while the wooden thread is turned away, leaving the wood in the form of a plain smooth cylinder. The steel plate is then re-inserted, and the whole securely riveted together. As shown in the cut, which gives a side and an end view of the tap, though the wooden part is cylindrical, the steel plate tapers towards the end that enters the hole, in order that, by the first teeth projecting but little, the instrument may cut gradually. A groove is cut on each side of the tap, where the plate is inserted, to afford room for the escape of the cuttings; and the upper end of the cylinder is made flat or square for the purpose of fitting the lever by which it is turned. Such a tap may be formed without the aid of a worm on the wooden stock, by simply dividing and notching the plate so that the teeth on one side are opposite to the notches on the other. When a double or treble-threaded screw is to be cut with this tap, notches must be made at the commencement of each thread with a hand tool, to make the tap commence cutting in the right place. Similar taps, with only two cutting edges, are proposed by Mr. Siebe for cutting screws in metal.



The large iron screws used in vices, presses, waggon-jacks, &c., are stated by Gill (*Technological Repository*, vol. vi., p. 289) to be formed by means of dies, turned with immense power by very long levers; the thread being made without cutting, by indenting and squeezing up the metal. The very best scrap-iron is required for the screws formed in this manner, on account of the twisting force to which they are subjected. The female screws are formed by winding a thin rod of iron into the worm of the male screw, so as to form it into a spiral thread, and then brazing it into a cylindrical case of wrought-iron; the nut being finished by grinding it with the screw, with the addition of sand and water.

In the ordinary method of cutting screws in a lathe, the size of the worm, or the distance between the threads, is regulated by a pattern screw, and cannot be varied from it. An ingenious machine is used in the Woolwich dock-yard for cutting a great variety of different screws from one pattern, of which a detailed description, with engravings, is given in the volume on Manufactures, in the 'Encyclopædia Metropolitana.' In this machine the bolt or cylinder upon which a screw is to be cut is placed in a lathe, while the die or cutter is fixed in a kind of sliding frame drawn forward by means of two regulating screws lying parallel with the bolt. These screws are turned by two small cogged-wheels working into a third fixed on the axis of the lathe; and by varying the relative sizes of these wheels, the pitch or inclination of the screw may be altered at pleasure. Thus, if the three wheels are exactly alike, the bolt and the regulating screw will revolve with equal velocity, and the thread produced will be of the same size as that of the pattern or regulating screw. If the wheels attached to the screws are smaller than that on the axis of the bolt, they will revolve more rapidly, and the thread produced will be wider than the pattern; and if the wheel on the mandril be the smallest of the set, the screws will revolve slower than the bolt, and a closer thread will be produced. By using many different sets of wheels, any variety may be produced. When a double thread is required, the screw or bolt must be turned half round after the first thread is cut, without moving the regulating screws; or for a treble thread, turned one-third round. The same machine is used for cutting female screws; the cutter or tap being fixed in the lathe, and the nut in the moving frame or slide-rest. In another screw-cutting machine used at the same establishment, the slide-rest is urged forward by a constant regular force, without the use of pattern screws; by which means the inconvenience of changing the cogged-wheels, and the risk of inaccuracy from the imperfection of the regulating screws, are avoided.

In making screws for mathematical or astronomical instruments, where the greatest accuracy is essentially necessary, it is especially desirable to avoid the risk of error arising from irregularities in the pattern screw, or in any part of the machinery used; and the plan communicated by Mr. Walsh to the Society of Arts, and published in the forty-second volume of their 'Transactions,' appears well adapted to attain this object. He proposes first to make a short cylinder of soft steel, twice the diameter of the intended screw. This cylinder is to be cut in the ordinary way with a double-threaded screw, and then hardened. The short screw thus produced is placed in the lathe, and a similar cylinder, but of the same diameter as the intended screw, is fixed in a frame and pressed against the first, until, by revolving in contact with it, it has received a perfect impression of the thread; which will be, owing to the different diameters of the two cylinders, a *single* thread; and *left-handed*, supposing the first cylinder to be cut with a right-handed screw. During the process the relative position of the cylinders should be occasionally reversed, by which any tendency to error will be counteracted. When completed the small cylinder is to be hardened, and then pressed against the intended screw, which is placed in the lathe, and to which it imparts its thread in the same way that it received it from the first steel cylinder; making it however a *right-handed* screw. The position of the steel cylinder should, as before, be frequently reversed; and it should be shifted but one thread at a time, until the whole length of the screw is impressed with the thread. The worm may be deepened with a pointed tool, but should be finished by repeated and varied revolutions in contact with the pattern. By the intervention of another steel cylinder, a left-hand screw may be produced from a right-hand one, or *vice versâ*.

SCREW OF ARCHIMEDES. The inventor of the machine so called is quite unknown, but both Diodorus Siculus and Athenæus ascribe the origin of it to the philosopher of Syracuse. The former relates (*Bibl. Hist.*, lib. i., c. 34) that irrigation was facilitated in Egypt by a certain machine invented by Archimedes of Syracuse, and called Cochlias (κοχλίας) from its form; and the latter states (*Deipnosophistæ*, lib. v., p. 206, Casaub.) that Archimedes invented it for the purpose of removing the water from the hold of the great ship which was built by King Hiero of Syracuse. Vitruvius (*De Architectura*, lib. x., c. 11) describes the machine under the name of cochlea. He says that it consisted of four or eight laths bent spirally and fixed at one edge against the axle, so as to form as many winding channels about it: and that the whole was covered by a cylindrical case, formed of planks, nailed over the exterior edges of the laths. The lower extremity was immersed in the water, which, rising along the channels by the revolution of the machine on its axis, was discharged at the upper extremity. Vitruvius adds that it was turned by men walking on its outer circumference, probably on the conical surface of a bevelled wheel fixed to the axle.

By the account which Vitruvius has given of its disposition, the spiral laths were placed nearly at an angle of 45° with the axle, and the latter was inclined to the horizon in an angle of 36° 52′. The cause of the ascent of the water, and the limits of the inclination of the axle to the horizon, are stated in HYDRAULICS.

The machine has been occasionally, in modern times, employed to draw water from docks, basins, &c.; and it might be used to raise globular bodies, as cannon balls, from one level to a higher, as from the hold of a ship to the top of a wharf. A similar machine, having the spiral detached from and revolving within the cylinder which is about it, has been much used on the Continent. It is said to raise more water than the usual screw, but it cannot be elevated at a greater angle with the horizon than 30°, and its action is more easily impeded by the sand or gravel which is frequently mixed with the water.

The Archimedean screw has been recently applied to the purposes of navigation, and a yacht bearing the name of Archimedes has been furnished with one in the *dead wood* under its counter, and between the keel and stern-post. This screw, which consists of a helix making but one revolution about a horizontal axle passing longitudinally through the ship, is put in motion by a steam-engine; and it is stated that its power of moving the vessel is equal to that of the common paddle-wheel. An attempt has been made to improve upon the machine by causing the helix to consist of two parts, each equal to half a revolution, which are placed at a small distance from one another on the same axle: by this disposition it is supposed that the escape of the water, after it has been acted on by the screw to propel the vessel, will be facilitated. Captain Carpenter has also obtained a patent for the application of four lozenge-shaped plates as propellers: these, which act on the same principle as the screw, are placed obliquely, in pairs, on two horizontal axles fixed in directions parallel to and on opposite sides of the keel, in order by their revolutions to give motion to the vessel to which they are attached. The action of the backwater is supposed to be entirely removed by this contrivance; and it is said that, in the event of an accident happening to the rudder, the action of one pair or both may be employed to give a power of steering the vessel.

SCREW-JACK, a portable machine for raising great weights by the agency of a screw. Portable jacks, which are sometimes worked by a rack and pinion instead of a screw, are used for raising heavy carriages when they have fallen owing to the breaking of an axle or the coming off of a wheel; the head of the jack being placed under the axle, or the framing the carriage, and then raised by turning the screw with a lever. The apparatus recently introduced under the name of the 'Universal Screw-Jack' is a great improvement on the common machine, as it allows lateral as well as vertical motion. In it the nut in which the vertical screw works is fixed in a carriage or sliding frame resting on the framework that forms the base of the machine, and capable of being moved upon it by means of an horizontal screw turned by a ratchet lever. This kind of jack is particularly useful on railways, where it affords a simple means of lifting a carriage or engine that may have run off the rails, and then moving it laterally until the wheels are in their proper position over the rails.

SCREW-PRESS, a machine for communicating pressure by means of a screw or screws. The screw offers great facilities for the application of power, as the force applied may be almost infinitely multiplied by increasing the length of the lever by which it is turned, and diminishing the distance between the threads. It is also very convenient in cases where a continued pressure is required; because, in ordinary cases, the friction of the screw is too great to allow it to run back on the removal of the power by which it is turned. In machines where the duration of the pressure is not required, and it is desirable to obtain momentum during the descent of the screw, as in a printing or stamping press, this property is not an advantage, and may be in great measure overcome by using a very wide or open thread.

In the common screw-press the articles to be subjected to compression are laid upon a stationary *bed*, or horizontal piece, forming the base of a strong frame, in the upper cross-bar or *head* of which a nut is firmly secured. The screw works up and down in this nut, and to its lower end is attached the *follower*, or moving piece which presses on the upper surface of the substance operated upon. The connection between the screw and this piece is such that the follower rises and falls, but does not turn round with the point of the screw; and the steady motion of the follower is provided for by making it fit closely to the side-pieces or cheeks of the press, which therefore act as guides. At the lower end of the screw there is usually a massive globular head, pierced with two holes at right-angles with each other, which receive the end of a long iron lever, by which the screw is turned. The screws of presses were formerly made of wood, and they are so still for some purposes not requiring great power; but as it is necessary to make the thread of considerable size in order to obtain strength, such screws are not adapted for giving great pressure. An iron screw, besides having less friction, may have its thread less than one-third the size of a wooden screw of equal strength, thereby increasing threefold the effect of the power employed in turning it. The use of iron instead of wood for the frame of the press is also a very great improvement, as even the hardest wood has been found insufficient to bear, for a length of time, the immense strains to which it is exposed in a powerful press.

The great space required for turning a long lever is a serious inconvenience in some cases, and has led to the contrivance of several methods for turning the screw with great power by a more compact apparatus. In a press invented and patented by Mr. Dunn, of Pentonville, the screw is turned by means of a short bent lever, resembling the handle of a printing-press, acting upon a ratchet-wheel fixed on the lower part of the screw; arrangements being added to enable the lever to rise and fall with the screw, and to unscrew the press by means of a second set of ratchet teeth on the wheel. In another ingenious modification of the common screw-press, invented by Mr. Pouchée, type-founder, of Holborn, a large cogged-wheel is fixed horizontally on the screw, just below the common head for receiving the end of the lever. A small pinion, having a square axis to receive a lever handle, is fixed on the platten or follower of the press, and works into the large cogged-wheel. This press is worked in the ordinary way until the screw is turned as far as the lever will conveniently move it. The bar is then removed, and the handle of the pinion put on, and by turning it the screw may be further depressed. If the pinion be turned by a lever of the same length as that used for the screw, the power of the press will be increased by this arrangement in proportion to the difference between the diameters of the large wheel and the pinion. Representations of this machine, and of that previously described, are given in Hebert's 'Engineers' and Mechanics' Encyclopædia,' art. 'Press.' In the same work, under the title 'Hot-pressing,' is given a plan of a screw-press for performing that operation, in which the plates do not, as in those of the usual construction, need to be removed for heating; they being kept at the necessary temperature by hot air introduced into four hollow columns, which serve the purpose of cheeks to the press.

While the diminution of the size of the thread affords the means of increasing the power of a screw-press, by reducing the distance traversed by the point of the screw during each revolution, it is attended by the serious disadvantage of diminishing its strength. This difficulty may be avoided by the use of a double or differential screw, the principle of which is explained in the article SCREW (p. 108, col. 1). This beautiful contrivance may be applied in different ways, but the description of one will suffice. The press may be made of the usual form, excepting that the lower end of the screw is cut, for a short distance, with a finer or closer thread than the upper part. This smaller screw is received into a nut or barrel resting on the presser or follower, and capable of turning on it when not held by a key. The head for receiving the lever by which the screw is turned is in this case placed above the head or top beam of the press, because its usual place is occupied by the moveable nut or barrel at the lower part of the screw. When in use the nut is, during the former part of the operation, keyed fast to the screw, so that it turns with it, and the action is exactly the same as that of the common press. When the screw has been turned as far as it will go in this way, the key that connected the nut with the screw is removed, and the nut is keyed fast to the presser. The screw being again turned, the lower thread enters the nut, so that the presser, instead of being moved at each revolution of the screw a distance equal to the width of the threads, is depressed only through a space equal to the difference between the width of the upper and lower threads of the screw; the effect being precisely the same as if it were moved by a very fine screw, with a thread only equal in width to such difference. By making the two parts of the screw very nearly alike in fineness, the distance traversed by the platten may be diminished, and the pressure increased almost to infinity.

Screw-presses are occasionally made with more than one screw. In one arrangement of this kind the screws are stationary, and the nuts, which are fitted into the follower of the press, are turned by means of toothed circles or cogged wheels driven by an endless screw laid horizontally on one side of the follower, and terminating at each end in a winch-handle. Mr. Brindley's press, patented in 1837, resembles the common press, except in having several screws instead of one, by which the patentee states that the pressure will be more evenly distributed. Though a greater or less number of screws may be used, four are recommended, each having a cogged wheel working into another fixed on a plain central shaft, which is moved by a winch and bevil gear.

It is unnecessary here to enter into the details of the various kinds of screw-press used for different purposes in the useful arts and manufactures. The common PRINTING-PRESS, which is a modification of the screw-press, is described in that article, in vol. xix., p. 18.

SCRIBES. In the article MOSES (p. 441) this word has been used as a translation of the Hebrew word שׁוֹטְרִים, which in the authorized version is translated 'officers.' The word which is translated 'scribe' in the English Bible is סֹפֵר, or in the Chaldee סָפַר, meaning 'a writer.' It was applied to an officer of tho king, or, as we should say, a 'secretary of state' (2 *Sam.*, viii. 17; xx. 25; 2 *Kings*, xxii. 3); also to a 'secretary-at-war,' who had the enrolment of the soldiers under his care. (*Jerem.*, lii. 25.) It was also used to signify men learned in the Jewish Scriptures. (*Ezra*, vii. 6, 11.) The last was the meaning which the word came to have in the later ages of the Jewish state, or rather, as the Jews regarded all learning as contained in a knowledge of their sacred books, the word *scribe* was used to designate all men of learning. In this sense we find it in the Apocrypha and the New Testament, as the translation of the words *γραμματεὺς, νομικὸς, νομοδιδάσκαλος*, for the *lawyers* (as our version generally translates the last two words) were evidently the same persons as the Scribes. Their office was to explain the law. They had seats in the Sanhedrim, and were generally Levites. In the time of Christ they appear to have been for the most part Pharisees.

(Winer's *Biblisches Realwörterbuch*, art. 'Schriftgelehrte.')

SCRIBO'NIUS LARGUS DESIGNATIA'NUS, an antient Latin physician, who lived at Rome in the reigns of Tiberius and Claudius, the latter of whom he accompanied in his campaign in Britain. He is the author of a work in Latin, 'De Compositionibus Medicamentorum;' but little is known of the events of his life, and even the language in which he wrote has been disputed. As the Latin of this work is somewhat barbarous, and as Galen, who never mentions any Latin writer, quotes the author, it was thought that it had been written originally in Greek, and translated afterwards into Latin. Physicians however have in general cared little for purity of language, and it may easily have happened that in the Silver age of Latin literature a practitioner may have written in a barbarous style. Besides, the diction itself proves that the work was originally composed in Latin (Bernhold, *Praefat. ad ed. Scribon. Larg.*, p. 17); and again, there is no author whom Galen has copied worse than he has Scribonius, probably because he did not understand Latin sufficiently well. (Cagnati, *Observ. Var.*, 8vo., Romae, 1587, lib. iii., c. 14, p. 222.) Although, says Sprengel (*Hist. de la Méd.*), in one place, Scribonius will not admit of any separation between the different branches of his art, at least he does not prove that he himself was ever able to unite the theory of medicine to the practice. He spared no pains in collecting together all the preparations mentioned in different authors (cap. 1, p. 35, ed. Bernhold), without paying the least attention to the difference of the diseases for which they were prescribed. He copied Nicander almost literally, and adopted from other authors a number of superstitious remedies. He believed, for example, that he had found a certain preservative against the bite of serpents in the plant which he called *ὀξετρίφυλλον* (Allelura), and which ought to be gathered with the left hand before sunrise (cap. 42, p. 91). He also recommended many preparations against *sighing;* which shows how much he was attached to empiricism (cap. 19, p. 51). Amongst other antidotes he much esteemed the *Hiera* of Antonius Pacchius (cap. 23), and a composition of Zopyrus of Gordium, which, according to the custom of the times, that physician prepared every year with much ceremony. The work of Scribonius is chiefly valuable for the information it contains relating to the Materia Medica of the antients. It was first published by J. Ruellius, at the end of his edition of Celsus, Paris, 1529, fol. This edition was printed in October, 1528, which therefore gives it a few months' priority over that published at Basle, 1529, 8vo., ap. And. Cratandrum, which is sometimes said to be the *editio princeps.* The best edition, according to Choulant ('Handb. der Bücherkunde für die Aeltere Med.,' 8vo., Leipzig, 1828), is that by Rhodius, Patav., 1655, 4to.; the last (which is less complete than the preceding) is Bernhold's, Argent., 1786, 8vo. A future editor may profit by three dissertations by C. G. Kühn, Lips., 4to., 1825-6, entitled 'In Scribonium Largum Animadversionum Ottonis Sperlingii Specimen.'

SCRIPTURE (*γραφὴ, scriptura*). This word means simply a *writing*, but it has long been used to designate the sacred books of the Old and New Testament. It is thus repeatedly used in the New Testament in reference to the Old Testament, and in one passage Peter applies it to the *Epistles* of Paul, and very probably he meant to include under the word some of the other books of the New Testament which were then written. (2 *Peter*, iii. 16.) The different forms in which this word occurs in the New Testament are 'the Scripture,' 'the Scriptures,' 'the Holy Scriptures,' 'inspired Scripture.' (2 *Tim.*, iii. 16; compare Smith's *Scrip. Test. to the Messiah*, chap. ii., note A.) The term *a Scripture* is also used for a passage in the Scriptures. (APOCRYPHA; BIBLE; CANON; and the titles of the different books of the Bible.)

SCRO'FULA, or SCRO'PHULA, the technical name for the disease that is popularly called 'the King's Evil:' the origin of the latter term will be explained presently; that of the former is very obscure and uncertain. We find the word *scrofula*, or rather *scrofulæ* in the plural, employed for the first time to signify the present disease, or one supposed analogous to it in cattle, by Vegetius (*De Re Veterin.*, lib. iii., cap. 23, ed. Schneider). It is generally admitted to be derived from the Latin *scrofa*, or *scropha*, 'a sow,' although the reason of the derivation is by no means clear. The same analogy, whatever it may have been, influenced also the Greek and Arabic writers in naming the disease, as the former call it *χοιρὰς*, or *χοιράδες*; and the latter *khanázir* (Avicenna, tom. i., p. 154; l. 36, p. 194; l. 30, vol. ii., p. 73, l. 12, ed. Rom., 1593, fol.; Albucasis, *De Chirurg.*, lib. i., cap. 22, p. 50, ed. Oxon., 1778, 4to.), both of which words are intimately connected with *swine*. The origin of the name, according to Paulus Aegineta (lib. iv., cap. 33), is either *ἀπὸ τῶν χοιράδων πετρῶν, ἢ ἀπὸ τῶν συῶν ὅτι πολυτόκον ζῶον, ἢ ὅτι τοιουτώδεις οἱ χοῖροι τραχήλους ἔχουσι*; according to Joannes Actuarius (*De Dignot. Morb.*, lib. ii., cap. 37) it is *τῷ τοῖς χοίροις τὸ τοιοῦτον πάθος συμβαίνειν, ὡς φασὶ, καὶ τῷ πολυγόνους ἐοικεῖν*; according to Avicenna (lib. iv., fen. 1, tract 2, cap. 9, tom. ii., p. 123, ed. Venet., 1564, fol.) it is 'propterea quod multa accidunt porcis propter gulositatem eorum, aut propterea quod figuræ earum secundum plurimum assimilantur porcis.' Dr. Forbes, in his 'Select Medical Bibliography' (*Cyclop. of Pract. Med.*, vol. iv.), 'hazards the following conjecture, as at least not more improbable than some that have been proposed, viz. that the smooth, rounded, conglomerated swellings of the submaxillary glands (to which the term was at first restricted), suggested the name, from their fanciful resemblance to a litter of young pigs lying huddled together, or even from the form of a single swelling bearing some resemblance in its rounded outline to the animal. 'This notion,' says he, 'may seem to derive greater plausibility from the fact that the Greeks actually gave the same name of *a young pig* (*χοιρὰς*) to small rocks just rising above the surface of the sea, from their fancied resemblance to the back of a pig when swimming; and it may not be altogether irrelevant to add, that the swelling produced by a blow upon the face or head is vulgarly termed *a mouse.*' The classical Latin term for the disease is 'struma' (Celsus, *De Medic.*, lib. v., cap. 28, § 7; Pliny, *Hist. Nat.*, lib. viii., cap. 77), or 'strumæ' in the plural (Celsus, lib. i., cap. 9; Pliny, lib. xxii., cap 16), which is also a word of which no satisfactory derivation has been given, as probably few persons will agree with Dr. Good in deriving it from *στρῶμα*, 'congestion,' or 'coacervation,' as of straw in a litter, feathers in a bed, or tumours in the body.'

The vulgar English name applied to it, viz. 'the King's Evil,' commemorates the virtues of the *royal touch*, to which, from the time of Edward the Confessor till the reign of Queen Anne, multitudes of persons afflicted with scrofula were subjected. A similar custom prevailed in France; and miraculous powers for the cure of scrofula were likewise claimed for different Romish saints, for the heads of certain noble families, for the seventh son, and for many consecrated springs. The *royal touch* requires some further notice, for though it is generally considered to be only a subject for ridicule, and is therefore disbelieved without inquiry, yet, if any one will take the trouble fairly to examine the evidence on which it rests, he will probably agree with Bishop Bull (*Serm.* 5, p. 133, ed. Oxford, 1827), that 'it is unquestionable that divers persons desperately labouring under it have been cured by the mere touch' [apparently] 'of the royal hand, assisted with the prayers of the priests of our church attending, unless the faith of all our antient writers, and the consentient report of hundreds of most credible persons in our own age attesting the same, be to be questioned.' That the kings of England for several centuries actually exercised their touch for the cure of scrofulous complaints, is proved by abundant historical authority; and scarcely any of our old historians, who wrote during a period of at least five hundred years, have omitted taking notice of this strange and unaccountable fact. We have not room here to give the evidence fully, and must refer those who wish to inquire more deeply into the subject to 'A Free and Impartial Inquiry into the Antiquity and Efficacy of Touching for the King's Evil,' 1722, by William Beckett, an eminent surgeon; 'Charisma, sive Donum Sanationis: seu Explicatio totius Quaestionis de Mirabilium Sanitatum Gratiâ, in quâ praecipuè agitur de solenni et sacrâ cui Reges Angliae, ritè inaugurati, divinitus medicati sunt,' &c. &c., 1597, by William Tooker, afterwards dean of Lichfield; 'Charisma Basilicon, or the Royal Gift of Healing Strumaes, &c.,' 8vo., Lond., 1684, by J. Browne; 'Several Chirurgical Treatises,' Lond., 1676, fol., and 1719, 8vo. 2 vols., by Richard Wiseman, principal surgeon in the army of Charles I., and serjeant-surgeon to Charles II., whom Haller (*Biblioth. Medic. Pract.*, tom. iv., p. 399) calls 'insignis certe et peritissimus chirurgus.' The question is examined at some length by Bishop Douglas, in his 'Criterion; or, Miracles Examined,' &c. &c., p. 191, ed. 1754, who, while he denies the alleged miraculous powers, fully admits the reality of the cures. See also Colquhoun's 'Isis Revelata: an Inquiry into the Origin, Progress, and Present State of Animal Magnetism,' Edin., 1836, 2 vols. 8vo., who also allows (vol. i., p. 87) 'the sanative efficacy of the process,' but connects it with the phenomena of animal magnetism. Among the most curious parts of the subject, it may be mentioned that the old Jacobites considered that this power did not descend to Mary, William, or Anne, as they did not possess a full hereditary title, or, n other words, did not reign by divine right. The kings of he house of Brunswick have, we believe, never put this power to the proof; and the office for the ceremony, which appears in our Liturgy as late as 1719, has been silently omitted. The exiled princes of the house of Stuart were supposed to have inherited this virtue. Carte, in the well-known note to the first volume of his 'History of England,' mentions the case of one Christopher Lovel, who, in 1716, went to Avignon, where the court was then held, and received a temporary cure; and when Prince Charles Edward was at Holyrood House, in October, 1745, he, although only claiming to be prince of Wales and regent, touched a female child for the king's evil, who in twenty-one days is said to have been perfectly cured. (*Hist. of the Rebellion*, in Constable's 'Miscellany.')

The complaint was well known to the antients. It is slightly mentioned by Hippocrates (*Coac. Prænot.*, tom. i., p. 321, ed. Kühn; *De Gland.*, p. 496; *Aphor.*, sect. 3, tom. iii., p. 725); Celsus gives a fuller account (*De Medic.*, lib. v., cap. 28, sect. 7); and it is described at some length by Galen (*De Meth. Med.*, lib. xiv., cap. 11, tom. x., p. 982, ed. Kühn); Paulus Aegineta (*De Re Med.*, lib. iv., cap. 33, and lib. vi., cap. 35); Haly Abbas (*Lib. Pract.*, lib. iii., cap. 33, et lib. ix., cap. 11, ed. Lugd., 4to., 1523); Avicenna (*loco cit.*), Albucasis (*loco cit.*), Leonidas (apud Aëtii, *Tetrab.*, iv., serm. 3, cap. 5, p. 741, ed. H. Steph.), &c.

Scrofula is defined by Dr. Good (*Study of Med.*) to be, 'indolent glandular tumours, frequently in the neck; suppurating slowly and imperfectly, and healing with difficulty; upper lip thickened; skin smooth, countenance usually florid:' which agrees almost exactly with the definition given by Cullen in his 'Nosology.' Its appearance is in general well known, but it has been sometimes mistaken, and a number of other ailments confounded under this title. It appears first as a tumor not confined in its earliest stages to any one part of the body; which tumor almost universally suffers no change of colour for some time, and is perfectly free from pain and inflammation; it is also commonly moveable, though not always. Its progress to an inflammatory stato is slow, and it is very gradually that it shows more and more pain, heat, redness, and swelling. Its progress afterwards to suppuration is as slow; and even after a fluctuation is perceived in the tumor, it is generally a long time before it breaks and forms an ulcer. The tumor differs particularly from a phlegmon, as it is very rarely pointed; sometimes it is so, but it never opens at the apex, but always at one or more lateral apertures, which are generally small at first. From these apertures flows a little purulent matter, but not in proportion to the size of the tumor; it is not so consistent as pus, but of a curdy nature, and whiter than purulent matter in general. This is discharged soon after the ulcer opens, mixed with a quantity of transparent gelatinous serum. The ulcer thus formed heals very slowly; its edges are seldom regularly circular or oval, and they are free from tumor and callus; by all which marks scrophulous ulcers may be easily distinguished. A soft, brittle, unorganised matter, resembling curd, or new cheese, is found mixed with the contents of scrofulous abscesses, or deposited in rounded masses of different degrees of firmness, varying in bulk from the size of a millet seed to that of a hen's egg. To the rounded masses of this substance, the name of *tubercles* has been assigned, and the substance itself is called *tuberculous*, or tubercular matter; and the presence of this matter is regarded by Dr. Cumin (*Cyclop. of Pract. Med.*, art. 'Scrofula') to be the most certain evidence of the existence of the disease.

Scrofula, though not a contagious disease, is unquestionably hereditary; and hence very generally dependent upon a peculiar diathesis. Yet, like many other hereditary diseases, it is also occasionally generated as a primary affection, without any hereditary taint that can be discovered. When it occurs as a primary or ingenerated affection, it is by no means always limited to any particular temperament or habit of body. But where scrofula appears hereditary, and especially where it does not show itself very early, it is often accompanied with a peculiar constitution. 'The character of a scrofulous child,' says Sir Astley Cooper, 'is as follows:—You will find the skin thin, if you pinch it, which is quite different from the skin of children who are not scrofulous; in them the skin is solid and dense, and the fibres strong; but in scrofulous the skin is thin, and the vessels may be seen meandering under it; and it is on this account that persons with this disease frequently have a rosy colour, arising from the thinness of the skin, which allows the vessels to be seen under it. The hair is also light coloured. If you observe, in a family of five or six children, one among them who has a delicate thin skin, with light hair and complexion, you will find that if they are all exposed to the same causes, they will escape from any scrofulous affection, with the exception of the one stamped by nature, and that this, during its growth, will be affected by the disease. The hair is also extremely fine, the eyelashes long, the pupils dilated, and the fingers are what is called clubbed, similar to the fingers in phthisical persons, *i.e.* they are extremely long and thin, but at the extremities are broad and flat. The upper lip is of considerable thickness, and this is a mark of debility.'

In considering the causes of a disease so deeply rooted in the constitution as scrofula is universally acknowledged to be, it is necessary to direct our attention to circumstances very remote in the history of those who are its subjects. The foundation of a scrofulous habit is frequently laid during the fœtal state, by the transmission of that peculiar organization of the frame from parents who themselves possess it. Scrofula is also observed to originate in the healthy offspring of healthy parents, under certain circumstances, the principal of which are habitual exposure to cold and damp, privation of free air and light, and want of healthful exercise. A moist, cold, and variable climate, like those of Great Britain and Holland, is particularly favourable to the development of scrofula; in proof of which it is sufficient to adduce the great prevalence of the malady in both of those countries. A very cold or a hot climate, on the other hand, serves rather to protect us against scrofula; the former, dry and bracing, invites to exercise, and promotes digestion, and thus strengthens the system; while the latter favours the excretions, particularly that of the skin, and preserves the body from those sudden changes of temperature which in our island so often lay the foundations of scrofulous affections. Among the causes which appear to give rise to scrofula in children, are the practises of rearing them by the hand and suckling them too long; two extremes, both of which often lead to the same result, — the imperfect nourishment of the child. Another cause of this disease is confinement in ill-ventilated apartments; for the deficiency of pure atmospheric air cannot be long endured, especially during youth, without the most injurious consequences. Acute diseases, especially those accompanied with cutaneous eruptions, as small-pox, measles, and scarlet-fever, are often observed to have the effect of producing the development of scrofula; and the more tedious the convalescence, the more frequently do symptoms of this disease ensue.

We proceed now to pass briefly in review the various parts and organs of the human body in which scrofula most commonly appears, and to point out the modifications of this disease induced by the different properties and textures of the parts affected. The first which presents itself is the common integument; for the three species of 'porrigo,' named 'favosa,' 'larvalis,' and 'furfurans,' together with 'eczema impetiginodes' and 'rubrum' in their chronic forms, are now frequently considered as strumous diseases. One variety of 'lupus,' or 'noli me tangere,' is decidedly a scrofulous affection; namely, that which commences with small, red, button-like prominences, which usually remain indolent for some time, and then form eroding ulcers, with pale, shining, spongy granulations, and encrusted margins. But the absorbent glands, especially those of the neck and mesentery, are the parts of the body which have long been regarded as the peculiar seats of scrofula, and the disease, when it attacks the latter organ, is of sufficient importance to require a separate notice under the head of TABES MESENTERICA. The enlargement and induration of these glands are still considered as affording more unequivocal evidence in the living body of the presence of that disease than any other circumstance except the discharge of tuberculous matter. A lymphatic gland, when first affected with scrofula, is soft and fleshy, and its size is increased; the texture, as proved by inspection, then becomes firmer, and the colour paler than in health: as the disease proceeds, portions of the gland are observed to have altogether lost their flesh-colour, and acquired a degree of semi-transparency, and a texture approaching to that of cartilage; at length a deposition of soft white or yellowish curd-like substance is found to have taken place, and the true scrofulous tubercle is now manifest. The size to which strumous glandular tumours attain is in some instances enormous. The lower jaw and upper part of the neck are occasionally seen hung round with such voluminous swellings as completely to deform the countenance; and in the case of a strumous middle-aged man, both groins have been seen occupied by vast glandular tumours, the larger of which equalled in size the half of a child's head at birth. The sublingual and submaxillary glands are often the seat of scrofula, the parotid more rarely; occasionally the tongue is attacked; and the mucous membranes are frequently affected with this disease. Those of the eye and lachrymal passages are peculiarly liable to it; which affection has been already described in the article OPHTHALMIA. The lungs have long been known to be particularly liable to scrofulous deposits; and so rare is it to find tubercle in any other situation without also finding it in the lungs, that Louis states he never met with an instance in all his numerous dissections excepting once, in the case of a man who had died of fever. When this organ is attacked, the disease assumes the name of PHTHISIS, to which article the reader is referred. The synovial membranes of joints are undoubtedly much more liable to disease in scrofulous subjects than others. Inflammation is more readily excited, and effusion of fluid into their cavities is more easily induced. The mamma and testicle are frequently attacked; the heart has been found affected, but rarely. The frequent occurrence of scrofula within the central organs of the nervous system has been satisfactorily ascertained. The chronic enlargement of the thyreoid gland is sometimes considered as scrofulous; but this opinion is probably incorrect.

The treatment of scrofula naturally divides itself into the *preventive* and the *curative;* the former of which is the most generally successful, and obviously the more important. As some children are born with tubercles, or the germs of them already formed, and as all are liable to become scrofulous under the influence of various conditions detrimental to the general health, the following advise is given by Dr. Cumin (*Cyclop. of Pract. Med.*) respecting the mode of rearing a child in whom circumstances justify the opinion of a tendency to the disease:—'When the child of a scrofulous father is born, the infant, unless the mother is free from all traces of the disease, ought to be consigned to a wet-nurse of sound and robust constitution, having an abundant supply of milk. This alone ought, for some months, to be sufficient for the nourishment of the child; but after a time, should it appear delicate, a little isinglass jelly may be allowed in addition, or liquid yolk of egg, or beef-tea, together with some preparation of wheaten meal or flour, or pure starch. Daily immersion in cold water, and gentle friction of the whole body, will be found of great utility. The child ought to be warmly clothed, to be carried about in the open air as much as possible, and the apartment in which it sleeps ought to be kept at a steady moderate temperature, and perfectly well ventilated. All rooms occupied as nurseries for children ought to be spacious and lofty, never situated in a sunk floor nor in an attic, and, if possible, considerably above the level of the ground.' To all individuals in whom a scrofulous diathesis is manifest, or even probable, and whose circumstances enable them to remove to a mild climate, and to localities judiciously selected, such change affords one of the best chances of preventing or checking the disease. The facts of scrofula being so prevalent in cold damp countries, noted for extremely variable temperature, like this kingdom, and of its comparative rarity in and total absence from some other parts of the world, prove sufficiently that climate is of all the exciting causes of scrofula the most powerful one.

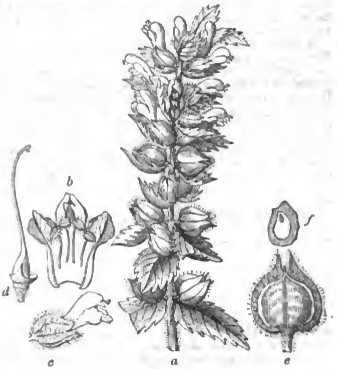
The *curative* treatment of scrofula may be divided into *constitutional* and *local* applications. With repect to the former, it would be impossible here to notice all the numerous remedies that have been recommended for the cure of this disease; we must be content with pointing out those that are most generally esteemed. Of all the remedies employed in the treatment of scrofula, perhaps none have enjoyed a greater reputation than mercurials; but it is only from their purgative and alterative effects that they prove beneficial, and not when they produce that powerful influence on the frame which so rarely fails to ensue from their free exhibition. Tonics are amongst the most valuable remedies; of these, cinchona is perhaps the most efficacious, and from the concentrated form in which it can now be exhibited (viz. the disulphate of quina), the most generally available. Other vegetable tonics and bitters have been administered with advantage in scrofula, such as calumba, gentian, and hop. Of the metallic tonics used in scrofula, iron is that which has been found the most beneficial; and the best forms of exhibiting it are the Vinum Ferri, the Tinctura Ferri Sesquichloridi, and the Ferri Sesquioxidum, in powder. Iodine, as prescribed by Lugol, is at present in considerable repute. It is successfully employed both internally and locally, in each of which modes it increases the action of the absorbents; and in the latter it likewise often induces suppuration of strumous tumours, and thus hastens their removal. The use of baths in the treatment of strumous affections is of great value, the kind of bath to be made choice of being determined by the existing state of the patient. Sudden immersion in cold water, and especially sea-water, has long been an approved remedy in scrofula; but when the strength of the patient is so reduced that no kindly glow follows, and when there is decided feverishness, the cold plunge bath is not admissible. In most cases the warm-water bath, and still more that of vapour, will be found highly soothing and restorative.

With respect to the *local* treatment, indolent scrofulous tumours, when the health is little reduced, may be dispersed or made to suppurate by continued pressure, or by blistering, which can be employed when the situation of the swelling will not admit of pressure. In the treatment of scrofulous ulcers, Mr. Russell considers that, under the ordinary circumstances of the complaint, the simplest and mildest dressings answer best. Cold spring-water is a favourite application with many practitioners; and preparations of lead are, upon the whole, very convenient and useful applications, provided the solutions be used in a state of sufficient dilution to prevent irritation. Formerly, the extirpation of scrofulous tumours was advised, but this method is now considered as being for the most part injudicious and unnecessary, with the exception of diseased joints and a few other parts which frequently require being amputated for the sake of saving the patient's life. Caustics have been employed for the same purposes, instead of the knife; but as they effect the object in view less certainly, more painfully and tediously, and cause extensive ulcers, they are disused by all the best surgeons of the present day. Some authors advise making issues, and keeping them open, in order to prevent any ill effects from the healing of the scrofulous ulcers. Issues may perhaps be unnecessary for any purpose of this kind; but they are eminently useful as a part of the local treatment of scrofulous joints and abscesses. When all hope of recovering a diseased portion of the body is at an end, the question immediately presents itself whether such part ought not to be removed by an operation. In considering the propriety of amputation, it is necessary to determine how far the continuance of the affections brings the patient's life into hazard, and whether he has still sufficient strength left to undergo the operation. When another important joint, or a vital organ, as the lungs or bowels, is already the seat of incurable disease, such operation is nugatory, and in such cases unquestionably it should not be performed. Great caution however is required in making our final decision; for every practitioner of experience has seen instances where the symptoms of visceral disease appeared almost to preclude hope, and yet have yielded on the removal of the local irritation, and a cure has been the happy result. (Cooper's *Surg. Dict.*; *Cyclop. of Pract. Med.*, &c.)

SCROPHULARIA'CEÆ, a natural order of plants belonging to the dicarpous group of monopetalous Exogens. The plants of this order are herbaceous or shrubby, with round and knotless or square and nodose stems. Leaves alternate, undivided or lobed, sometimes collateral; the floral ones sometimes double and placed near each other. The inflorescence is variable, usually spicate, racemose or paniculate, seldom solitary. The calyx is 5-parted, seldom 4-parted; the sepals often unequal, the upper one being largest, the two lowest smaller, the lateral ones smallest; corolla 4-5 parted, tube short or long, limb flat or erect, nearly equally divided or labiate, imbricate in æstivation; stamens 2-4, didynamous, rarely equal, alternate with the lobes of the corolla, the fifth stamen and sometimes the three upper ones abortive; anthers 2-celled or sometimes growing together 1-celled, opening longitudinally; ovary superior, 2-celled, many-seeded; style simple; stigma mostly simple, entire, emarginate or bifid, often flattened, occasionally double at the points of the divisions of the style; fruit capsular, seldom berried, bi-carpellary, 2-celled, sometimes with 2 entire or bifid valves, sometimes with 4 entire ones, sometimes opening by pores or lids, dissepiment parallel or opposite to the valves, finally loose in the centre, or altogether; placentæ adhering to the dissepiment; seeds indefinite, albuminous.

Scrophulariaceæ are nearly allied to Solanaceæ, and in some instances it is difficult to say to which of these two orders plants may belong. Bentham separates these orders by a purely artificial distinction, considering as Solanaceæ such genera as have a plaited corolla and 5 stamina, and as Scrophulariaceæ all those in which either the fifth stamen is wanting or the æstivation of the corolla is imbricated. Of the orders with irregular flowers, those which may be mistaken for Scrophulariaceæ are Gesneraceæ and Orobanchaceæ, which are distinguished by their unilocular ovarium with parietal placentæ; and the Bignoniaceæ, Cyrtandraceæ, and Pedaliaceæ, which have seeds without albumen, and the two latter have a unilocular or spuriously 2-4-locular fruit. Lentibulaceæ are closely allied to this order, but are distinguished by their unilocular fruit, free central placentæ, and minute embryo.

The Scrophulariaceæ, are very widely diffused over the surface of the earth, being found in the whole range of climate between the coldest point at which vegetation occurs at the poles, and the hottest parts of the tropics. In the torrid zone of both worlds they are very abundant, and form a 26th part of the flowering plants of Europe and a 36th of those of North America. In New Holland and New Zealand they are common, and the barren shores of Tierra del Fuego produce several species. Scrophulariaceæ are in general suspicious plants. Several of them are active poisons, and though all do not possess deleterious properties, they are all more or less acrid. Some are esculent, but they require great caution in their preparation as food: heat or vinegar appears to lessen or destroy their injurious principles, and these agents should be employed in preparing them for use. Amongst those which are edible are the *Mimulus lutea* and *guttatus*, the former being eaten as a pot-herb in Peru, and the latter as a salad. *Achimenes cochinchinensis*, when pickled, is much esteemed, in the country where it grows, as an article of diet. Many of the species of this order are used in medicine: the *Digitalis purpurea*, or purple foxglove, has a powerful influence on the system and is a valuable remedy in many diseases. [DIGITALIS PURPUREA.] *Gratiola officinalis*, the hedge hyssop, is also an active medicine, and so efficacious was it once esteemed that it received the name of *Gratia Dei*. It is bitter, and acts as a purgative and emetic, and is indebted for these properties to a peculiar principle called *gratioline*. Scrophularia, the genus which is the type of the order, derives its name from the resemblance of the tumid roots of some of the species to scrophulous swellings of the neck, to which they were applied upon the absurd supposition that nature thus pointed out the remedies for diseases. *S. nodosa* has a bitter taste, and a decoction of its leaves is used for curing the scab in swine. *S. aquatica* is called by the French *herbe du siège*, from the circumstance of the garrison of Rochelle, during the celebrated siege by Cardinal Richelieu in 1628, having supported themselves by partaking of its root.



Rhinanthus hirsuta.

a, cutting, showing leaves and inflorescence; *b*, corolla opened, showing didynamous stamens; *c*, personate corolla, and calyx; *d*, pistil; *e*, fruit; *f*, seed with embryo lying in the albumen.

SCRUPLE (*scrupulum*, diminutive of *scrupus*, a term for a sort of pebble, probably used in counting) is now used only as the third part of a dram, or the 24th part of an ounce, in the apothecaries' division of the troy pound. It was used originally as the 24th part of the Roman uncia; afterwards as the sixtieth part of an hour, or what is now called the minute. The sixtieth part of a minute was called scrupulum secundum, the sixtieth part of a scrupulum secundum was scrupulum tertium, &c., whence our terms second, third, &c. applied to the sexagesimal divisions of the minute. It is worth noting that the antient form of the word is also scripulum and scriptulum, which might suggest a different derivation of the word as a weight or measure. It may be worth while to add that the scrupulum is described by lexicographers as a small pebble, such as found its way between the sandal and the foot, whence the use of the word to denote a difficulty or objection.

SCUDE'RI, GEORGE DE, was born about 1601, at Hâvre in Normandie, of which place his father was governor (lieutenant de roi). Young Scudéri was brought up by his father to the profession of arms, but he quitted it about 1630 for that of a dramatist, in which he had at first little success, and was very poor; but both his reputation and circumstances gradually improved, and he was regarded by many as equal to P. Corneille, with whom he was on terms of intimacy, till the unusual success of 'The Cid' threw Scudéri into the shade, and caused a feeling of envy, to which he gave vent in 'Observations sur le Cid,' Paris, 1637: these Observations were published anonymously, but the author soon became known, and Corneille replied in a bitter epigram, in which he described his late friend as a 'solemn fool.' Scudéri however was favoured by Cardinal Richelieu, who was also offended to find that Corneille had obtained a degree of patronage from the public which rendered the great poet independent of the great minister. In 1641 or 1642 Scudéri was appointed governor of Notre Dame de la Garde, a small fort situated on a rock near Marseille, where he went to reside, but soon returned to Paris, and it was humorously said of him in 1656, that he had 'shut up the fort, returned to Paris by the coach, and for fifteen years had carried the key in his pocket.' In 1650 he was elected a member of the Académie Française. He died at Paris, May 14, 1667.

In the period from 1631 to 1644, Scudéri produced sixteen plays under the following titles:—'L'Amour Tyrannique,' 'Armenius,' 'Orante,' 'Lygdamon,' 'Le Vassal Généreux,' 'Le Trompeur Puni,' 'La Mort de César,' 'L'Amant Libéral,' 'Didon,' 'Eudoxe,' 'Andromire,' 'Axiane,' 'Le Fils Supposé,' 'Le Prince Deguisé,' 'L'Illustre Bassa,' and 'La Comédie des Comédiens.' He also wrote 'Poesies Diverses,' Paris, 1649, 4to., and 'Alaric, ou Rome Vaincue,' Paris, 1654, folio, an heroic poem, which he undertook at the request of Christina, queen of Sweden. He also wrote a few other works, but they are not worth mentioning.

Scudéri is one of those who have left 'a lasting tomb.' His name is familiar to us from the reputation which he once had, but both his plays and poems are deservedly neglected, or are only looked into from a motive of curiosity. He was a man of excessive vanity, and in the prefaces to some of his plays boasts of his own merits in terms which indicate the most perfect self-satisfaction, which, taken in connection with the patronage of Richelieu, may partly account for the fame which he had in his day, the mass of mankind, little capable of judging for themselves, for the most part allowing a man to take that station which he assumes, rather than placing him in that to which his merits entitle him.

SCUDE'RI, MADELE'NE DE, the sister of George de Scudéri, was born in 1607. She is the authoress of several voluminous romances which had an extraordinary reputation:—'Ibraham, ou l'Illustre Bassa,' Paris, 1641, 4 vols. 8vo.; 'Artamène, ou le Grand Cyrus,' Paris, 1650, 10 vols. 8vo.; 'Clélie, Histoire Romaine,' Paris, 1656, 10 vols. 8vo.; 'Almahide, ou l'Esclave Reine,' Paris, 1660, 8 vols. 8vo. 'L'Illustre Bassa,' 'Cyrus,' and some of the first volumes of 'Clélie,' were published under the name of George de Scudéri, but after the authoress became known her other works were published anonymously. Besides these grand romances, Mademoiselle de Scudéri wrote—'Celinte,' 1661, 8vo.; 'Femmes Illustres, ou Harangues Heroïques,' 1665, 12mo.; 'Mathide d'Aguilar,' 1669, 8vo.; 'La Promenade de Versailles,' 1669, 8vo.; 'Discours de la Gloire,' 1671, 12mo., which obtained the prize of eloquence given by the Académie Française; 'Conversations sur divers Sujets,' 1684, 2 vols. 12mo.; 'Conversations Nouvelles,' 1684, 2 vols. 12mo.; 'Conversations Morales,' 1686, 2 vols. 12mo.; 'Nouvelles Conversations de la Morale,' 1688, 2 vols. 12mo.; 'Entretiens de Morale,' 1692, 2 vols. 12mo.; 'Nouvelles Fables en Vers,' 1685, 12mo.; besides a great number of 'Vers de Sociéte,' addressed to her contemporaries.

Mademoiselle de Scudéri was a sort of queen of the Parisian Blue-Stockings, the 'Précieuses Ridicules' of the seventeenth century, and she enjoyed this 'high and palmy state' of honour till her death, which did not occur till June 2, 1701, when she was in her 94th year. The praises bestowed upon her were not confined to the fashionable society of the Hôtel de Rambouillet, of which she was the acknowledged dictator, but eulogiums in no measured terms were bestowed upon her by Huet, the learned bishop of Avranches, by Mascaron, bishop of Tulle, by the cardinal De Bouillon, and many others. Christina of Sweden honoured her with her correspondence, and gave her a pension. She had a pension also from Cardinal Mazarin, which, at the request of Madame de Maintenon, was continued and augmented by Louis XIV.

Mademoiselle de Scudéri seems to have been indebted for her pre-eminence of honour partly to the tact with which all her works were adapted to the usages of the society in which she moved, many of the frequenters of the Hôtel de Rambouillet being recognised in the heroes and heroines of her romances, and partly to a factitious brilliancy of conversation which consisted of ridiculous puerilities and a play of imagination in the worst taste, all founded upon those conventionalisms of politeness and gallantry which were current among the fashionable society of that age. Love was the inexhaustible theme of all these romances and conversations; the heroes of antiquity are transformed into French petit-maîtres, and the heathen mythology supplied its store of imagery and allusion to decorate the fashionable manners and personages of the age of Louis XIV. It must be added however that Mademoiselle de Scudéri appears to have been a woman of very amiable disposition, was greatly esteemed by her female associates, and had several professed admirers among the gentlemen, though she was very ugly.

(*Biographie Universelle;* Moreri,' *Grand Dictionnaire Historique.*)

SCUDO. [MONEY.]

SCULPTURE, in its strict sense, is the art of carving or cutting any material into a proposed form or shape. In its more general acceptation it is the art of representing objects by *form;* and is thus applied to carving, modelling (or the plastic art), casting, whether in metal or other materials, and to gem-engraving. Sculpture is practised in various ways; namely, in forming entire or insulated figures, as statues or groups, called, in technical language, 'the round;' or in representing objects more or less raised without their being entirely detached from a background. This latter is termed 'relief,' and the degrees of relief are defined by modern writers and artists by the expressions *alto-rilievo*, when the object is so salient as to be nearly 'round;' *basso-rilievo*, when it is slightly raised from the background; and *mezzo-rilievo*, when a medium is preserved between the extremely high and the very flat 'relief.' There is another variety of this manner of working 'basso-rilievo,' which is only or chiefly found in Egyptian sculpture; the outline is sunk into the plane or ground, and the parts are then formed and rounded on the principle of basso-rilievo. By this mode of working there is usually no projection beyond the profile or face of the original ground; to gain effect therefore in this kind of *relievo intaglio*, the Egyptian artists frequently painted the sculpture.

It is not necessary to enter into a discussion of the various opinions respecting the comparative antiquity of the arts of painting and sculpture. Pliny's story (*Hist. Nat.*, xxxv. 12) of the daughter of Dibutades having traced the outline of her lover's profile on the shadow cast on the wall and of this outline being afterwards filled in with clay by her father, would give the priority to drawing; and it seems obvious that drawing an outline must be antecedent to modelling, or cutting in *relief;* but a little consideration will suffice to establish the probability that *insulated* objects and figures were made in the very earliest times. So many materials offered themselves upon which the imitative faculty could be exercised, that there can be little doubt that rude attempts at forming clay, or any other plastic substance, into a defined shape, were amongst the first exercises of human ingenuity; and the easy task of thus repeating or copying the real form of an object, compared with that of representing by lines (and on a flat surface) its partial and perspective appearance, is quite sufficient to lead to the inference that this was the earliest mode of imitation. The antients appear to have availed themselves of every known material that was capable of being employed in sculpture. Pliny, Pausanias, and other writers supply some curious information on this subject, for, in describing works of art, they usually mention the materials in which they were executed.

For modelling, clay, wax, and stucco, or plaster, appear to have been universally adopted; and works of great antiquity, formed of these substances, are still preserved. The clay model was usually baked, by which it acquired a hardness scarcely inferior to stone. Moulds were also made of clay, and being subjected to the above process, were safely used as forms into which softer substances could be pressed, and thus objects were multiplied without difficulty. The almost countless number of figures, bassi-rilievi, lamps, tiles, architectural ornaments, vases, domestic utensils, stamps, &c., which are found of this material (called *terra-cotta*, baked earth), proves the extent of its employment in the earlier ages of art. The objects usually composed of terra-cotta are of small dimensions, but there are instances of its being used for works of considerable size. In the Museo Borbonico at Naples are two statues, of Jupiter and Juno, above six feet high, and two others, one of an actor and the other an actress, above four feet high. They were found at Pompeii. The larger figures are inferior in their forms to the others, but whether the faults of proportion arise from the shrinking or contraction of the clay in baking, or were errors in the original modelling, it is not easy to determine. The specimens of *terra-cotta* preserved in England are for the most part of small size; but there are some very beautiful objects, both for execution and subject, in the Townley collection of the British Museum. It appears highly probable that the antients always, or almost always, painted their *terra-cotta* works. In many instances the colour still remains, and the draperies of figures, and portions of architectural ornament, often exhibit well preserved designs of border patterns. The employment of wax for modelling and casting can be traced to a very remote period. The Romans also employed it for making statues, or perhaps only busts. It was a custom in some families to preserve portraits of their ancestors. They were kept in an apartment in their palaces especially appropriated to this pious purpose, from which they were only removed on particular occasions, such as on the death of a member of the family, when it was considered a mark of distinction to carry before the body of the deceased the representations, or *icones*, of his more eminent predecessors. Pliny alludes to these figures of wax (xxxv., 2). On occasions of ceremony, and at particular festivals, they often were dressed in real drapery. A great proportion of the ornamental work in the buildings of Pompeii is of *stucco* or plaster. On the outer walls of a small temple or chapel in the court of the temple of Isis there were, some few years ago, two stucco bassi-rilievi of considerable size and of good design, but which, by exposure to the atmosphere, and other injuries wantonly inflicted by travellers, are now nearly if not entirely destroyed. Few collections of antiquities are without specimens of figures and ornaments modelled in this material. Some in the British Museum are examples of great delicacy and sharpness of execution. Many of them are painted; red is the prevailing colour.

The list of materials used for *carved* works comprises every substance, hard or soft, that could by possibility be employed for the purpose, including porphyry, basalt, granite, marble, alabaster, ivory, bone, and wood of all kinds. The three first-named were used chiefly by the Egyptians, who seem, in all their monuments of art, to have worked with the view of securing the durability of their productions, employing, whenever they could do so, and especially for works of importance, materials likely to resist the action of the atmosphere. When the introduction of some of the superstitions of Egypt into Rome led to the adoption of the Egyptian style of sculpture, it became the fashion to execute works of art in the above materials; but this did not occur till the reign of Hadrian, before and after which time they are seldom met with.

The variety of marbles known and used by the antients is almost infinite. (Pliny, *Hist. Nat.*, xxxvi. 7.) Those preferred for their superior texture, colour, or applicability to sculpture, were, first, the Parian, which was found in the island of Paros. It is called also Marpessian, from the mountain from which it was brought; and sometimes Lychnium or Lychneum, perhaps from its bright sparkling appearance. In the second rank was the Pentelic marble, which was procured from Mount Pentelicus, in the neighbourhood of Athens. It was highly esteemed by the sculptors of antiquity. Its colour, like that of the Parian marble, is white; but it usually has a cold bluish tone, arising from the grey, and sometimes greenish, streaks that run through it; while the general hue of the marble of Paros is warm and creamy. The Italians often call the Pentelic marble *marmo salino*, from the salt-like appearance of its grain or crystals. The marble of Mount Hymettus in Attica was also much esteemed; it resembled in colour the Pentelic. After the conquest of Greece by the Romans, this marble was imported in great quantities into Italy. Lucius Crassus introduced it most extensively in the decoration of a palace which he built on the Palatine; an instance of unusual luxury, which was much reflected upon at the time. The marble of Thasos seems to have been much used, especially for architectural purposes. It was employed for covering and encasing edifices, and for lining reservoirs and fish-ponds. The Italian marble was procured from Luna, in the range of mountains near which are the modern towns of Massa and Carrara. These quarries seem to have been unknown till about the time of Julius Cæsar, when they were extensively worked. The grain of the Carrara marble is finer than that of the Greek marbles above mentioned. Its colour is usually a rich white, and it bears a close resemblance to fine lump sugar. It is seldom found quite pure; veins and spots of black, grey, and red and yellow (oxides of iron) occur in it. The produce of the different excavations varies in colour and quality, and large crystals are sometimes met with which resist the chisel. The marble of the antient Luna, where remains of the former working may still be seen, is considered to be finer in grain and more compact in texture than the ordinary Carrara marble. The Romans worked quarries in Africa which produced limestone and white marble with veins of pale grey. The quarries in Greece are no longer worked, and the chief, or it may be said, the only supply of statuary marble is at present from Italy. These were the principal white marbles which were employed by the sculptors of antiquity, and in which some of the finest remains of art are executed.

Among the varieties of wood in which objects were carved, we find oak, cedar, cypress, sycamore, pine, fig, box, and ebony. Cedar was thought to be very durable, and on that account was used, Pliny says, for images of the gods; the same author especially distinguishes cypress, cedar, ebony, and box, for their capability of resisting the injuries of time. (Plin., *Hist. Nat.*, xvi., 40.) Pausanias saw several statues of wood during his travels in Greece, and the following instances will serve to show that this apparently humble material was employed for representing the most elevated personages in the antient mythology. The statue of Apollo Archegetes was composed of ebony, as was the statue of Diana Limnitia. At Lacedæmon the statue of Venus was of cedar. A statue of Apollo made of box adorned the treasury of the Sicyonians in the Altis. In the temple of Castor and Pollux at Argos were their statues, those of their children, and of their mothers, all made of ebony. All these works in wood have perished, notwithstanding Pliny's observation, 'Materiae ipsae aeternitas' (*Hist. Nat.*, xiii. 5). A few however of smaller dimensions have been found in tombs. They are chiefly figures of Egyptian idols; and the wood of which they are made seems to be sycamore. Gold, silver, iron, tin, copper, lead (and their compounds), wax, and plaster were all used for the purpose of *casting*. [Bronze; Founding] A mixture of gold and silver, in the proportion of one to five, formed a composition termed *Electrum*. According to Homer, Helen presented to the temple of Minerva at Lindus, in Rhodes, a cup made of electrum, of the exact form and size of one of her own breasts. A mixture of copper and tin, with sometimes, but not always, small portions of other metals, formed what the Greeks called *Chalcos* (χάλκος); the Romans, *Æs;* and modern artists (from the Italians), *Bronze*.

There was a statue of Augustus of *amber;* and at the celebration of funeral ceremonies, as those in honour of Sulla, statues were sometimes made of *gum* and *aromatics*, as well as of other materials of the most combustible nature, as, for instance, of *hay*. Among the strange conceits of artists there is mention of a statue of the goddess of Love made of *loadstone*, which attracted a Mars of *iron*.

The union, or rather, combination of different marbles in the same work was called *polylithic* sculpture. When painting or colouring was resorted to, it was termed *polychromic* sculpture. These mixtures, which modern taste disapproves, were resorted to by the most celebrated artists of antiquity, and during the most flourishing period of sculpture and architecture in Greece. The various architectural members of their temples were picked out in red and blue; and the backgrounds, and frequently parts also of the sculpture itself, especially of rilievi, were coloured, to give further effect to the design. There can be no doubt that the peculiar circumstances of the climate must materially affect the appearance of this kind of decoration. What in the dull atmosphere of northern countries would, at the best of times, appear either dingy or tawdry, might easily be imagined to have a very different effect when seen clearly defined and relieved against a cloudless blue sky, and by the bright glare of a southern sun. The combination, under such favourable circumstances, of white marble, of which the temples were usually constructed, with simple though brilliant colours to indicate the mouldings or smaller members of the architecture and sculpture, sparkling with gold ornaments, certainly offers to the fancy a spectacle of surpassing splendour. It is not quite so easy to reconcile with *our* notions of propriety or good taste the mixture of materials for sculpture *within* buildings, where space, and sometimes light, if the temple were not open in the roof, would be wanting to dissipate the heaviness of effect which it is conceived such works would have. The introduction of foreign substances, either metal, precious stones, paste or glass, for eyes in statues and busts (of which examples occur in works even of the best period of art), is a species of barbarism that is quite unaccountable, and which the most zealous admiration of the genius of the Greeks cannot qualify or excuse. Such instances may however be considered exceptions to the rule of pure taste and simple feeling which is exhibited in the greater number of works by the sculptors of Greece; and modern experience will probably afford the best solution of what would otherwise seem an anomaly, by suggesting that the artists, even of those times, were occasionally dictated to, and their own better taste overruled by the caprice of their employers. It seems difficult to account otherwise for the strange circumstance of the lips as well as the eyes being inlaid. There is more than one example of this among the fine bronzes preserved at Naples.

Inscriptions were sometimes inserted into bronze statues; the letters being of a different metal from the figure. Cicero (*In Verr.*, Orat. iv.) speaks of an Apollo inscribed with the name of Myron. In the collection at Paris is a statue of a youth in bronze, on the left foot of which are the remains of two Greek words, ΑΘΑΝΑΙΑ . ΔΕΚΑΤΑΝ, in silver letters.

There was a very peculiar combination, rather referred to than described by antient authors, by which shades or tints of colour were produced. Plutarch (*Symp.*, lib. v.) says that the sculptor Silanion made a statue of Jocasta, the wife of Laius, king of Thebes, in which she was represented dying. To increase the intensity of the expression of the countenance, the artist, by an ingenious mixture of the metals of which the statue was composed, had produced a pallid appearance. This, he says, was effected by the addition of silver. Callistratus admires a bronze statue of Cupid by Praxiteles, for its elegant position, for the arrangement of the hair, its smile, the fire in its eyes, and, he adds, there was in its countenance a vivid blush. He observes the same thing, and with equal admiration and astonishment, of a statue by Lysippus. After describing the work generally, he says, the cheeks were coloured like the rose, and those who saw it were struck with surprise at seeing the bronze imitate the appearance of nature. The same remarkable effect is noticed in a bronze statue of Bacchus of Praxiteles. To these may be added a statue of Athamas at Delphi, mentioned by Pliny. He was represented sitting after the murder of his son Learchus, whom he had precipitated from a rock. This work, he says, was not entirely of iron; for the artist Aristonidas, wishing to express the effect of confusion and remorse in the countenance of the king, used a mixture of iron and bronze, which should imitate in some measure the blush of shame. (Plin., *Hist. Nat.*, xxxiv. 14.) Other notices might be quoted of this practice of the antients. The writers who refer to these effects describe them as the result of study and intention on the part of the artists, and do not allow us to suppose that the mere accident of oxidation and decomposition produced them. The art seems to be quite distinct from that called *toreutic;* the latter being the union of distinct materials, easily removeable, while the former is described as effecting an amalgamation which produced shades or tints. The few writers who speak of it are certainly general in their observations, and give no technical details of the manner of effecting these combinations; but this hardly justifies the entire rejection of their testimony as to what they saw. It is most probable that they coloured the statues after they were cast, as Pliny says was done in Egypt (xxxiv. 9). The different compartments and objects in the shield of Achilles (*Iliad*, xviii.) are described as exhibiting different colours. This however, whether the passage be Homeric and genuine, or interpolated at a later though antient period, may have been a specimen of *toreutic* art. That the antient sculptors increased, or imagined they increased, the effect of their productions in marble by adding colour, not only tradition but existing monuments testify. It is therefore not only possible but highly probable that they had some process with which we are unacquainted, by which they were able to produce some similar effects in their metal works.

Writers on art have usually been desirous to show that it had its origin in and was derived from some one particular nation; that its principles were by degrees acquired by the various peoples with whom that nation had communication, and its practice carried into distant countries by the accidental intercourse of commerce, war, and colonization. There is no reason for believing this to be the case. There can be no doubt that the intercourse of nations materially affected the style and manner of already existing art; or that where it was not known, its practice may have been thus taught; but experience has proved, by the discovery of examples of imitative art in remote countries that cannot by any apparent possibility have had any communication, that such intercourse is not absolutely necessary for its existence; its invention having been an unaided effort of original feeling, and the exercise of the natural faculty of imitation.

Sculpture, as it was practised by the most antient nations, must be viewed in a very different light from that in which we consider its employment in more modern times. With a comparatively uncivilized and unlettered people sculpture and typical art were the only means of representing ideas, and it had its origin almost in the wants of man. With later nations (even of a remote antiquity) art became in a degree a refinement; and then the various changes and improvements were adopted that now occasion the difficulty in distinguishing between original and engrafted styles.

The few notices that are scattered over the writings of the antients are quite inconclusive as to a common origin of art; although certain received opinions upon the subject are occasionally met with. The very late date of the oldest of these writers, compared with the undoubted antiquity of the arts of design, accounts sufficiently for the difficulties they laboured under in collecting any trustworthy evidence on such points, and for the fables, exaggerations, and contradictions that abound in their statements. The adventures and works attributed to Dædalus, for instance, are a proof of the limited knowledge that existed of the first artist whose name occurs in the annals of Greek sculpture. The inventions and improvements in various useful arts due to a series of artists, and for which a single life would be insufficient, are nevertheless all ascribed to this one individual, who, after all, bore a name that in all probability was merely a general appellation given in early times to any skilful workman or artificer. In the same manner we find the introduction into Italy of the plastic art (simple modelling) attributed by Pliny to a refugee from Corinth at so late a date as about 600 B.C. The arrival in Etruria of Demaratus may have introduced changes or improvements in the fabric and decoration of vases. The names of the artists who are said to have accompanied him, Eucheir and Eugrammus, sound like epithets indicative of skill, rather than simple names of persons. Some writers speak of images having fallen from heaven. These several instances are referred to in order to show that even where tradition had supplied scattered and undefined notices of works of art of a remote date, they had become so subject to change and misrepresentation as succeeding generations received and in their turn again recorded them, that it would be vain to place any dependence upon them for a history of the origin of art. The inquiry into the precise time, the country, the circumstances when the first efforts in sculpture were made, must therefore be attended with almost insuperable difficulties. Not so the establishment, at a later period, of epochs marked by changes in style, and what artists call treatment.

The desire to perpetuate the memory of extraordinary events, of remarkable persons, or of their actions; to honour heroes and benefactors even during their lives, and to hand down to future ages the fame of their exploits, has been universal, and has rendered the arts by which such an end could be attained objects of universal interest. The first works applied to this purpose were no doubt marked by the greatest simplicity. The oldest and most authentic histories speak of monuments erected to mark the scene of any remarkable incident; and although, at the early periods referred to, these monuments were only composed of rude blocks, or mere heaps of stones, still to such a simple commencement may doubtless, in a great measure, be traced the origin of sculpture. Jacob set up a heap of stones at Bethel to mark the spot where he had had his dream or vision. (*Gen.*, xxviii. 18.) A similar simple memorial of a pillar and a heap of stones commemorated the covenant entered into between Jacob and Laban. (*Gen.*, xxxi. 44.) A similar monument was built over the grave of Rachel. (*Gen.*, xxxv. 20.) Joshua also set up a great stone under an oak, 'to be a witness.' (*Josh.*, xxiv. 27.) As late as the time of Pausanias, about A.D. 170, certain of the Grecian divinities were worshipped under the form of rude blocks or mere columns, or stones set upright (Paus., vii. 22); and even in the present day the custom exists in some countries of setting up a heap of stones to mark the spot where any extraordinary accident, such for example as a death from violence, has occurred. These are frequent in Italy, where the passer-by usually adds another stone to the heap, at the same time repeating a prayer for the repose of the soul of the deceased.

It has been said that the history of sculpture is almost the history of idolatry. Religious feeling doubtless had its share in forwarding the progress of the arts; for man, even in his rudest state, always has a belief that good and evil emanate from some superior power; and, unable to comprehend a divine essence or spirit, has by degrees been led to offer his addresses to some visible object as its representative. But it seems probable that the first images or statues were of men rather than of gods; and thus that human idols preceded those of divinities. This supposition is strengthened by the fact that the heavenly bodies were the earliest objects of worship among the heathen nations; and the symbols that were afterwards dedicated to them were most likely merely pillars of a conical or pyramidal form, and not imitations of the human figure; and when such works are referred to and called 'graven images' by Moses, it has ingeniously been supposed to be in allusion to the signs or hieroglyphics inscribed or cut on them. The sun was worshipped at Emesa under the form of a black conical stone with marks to represent the sun. (Herodian, v. 6; Gibbon, vol. i., c. vi.)

Traditional accounts of wonderful feats in arms, the real or fabled history of a conqueror, or a lawgiver, or the founder of a nation, led in all probability to the first attempts at making a portrait figure or image, which a rude and uninformed people, always attracted by the marvellous, associating with it actions of supernatural prowess, would soon learn to contemplate with feelings both of admiration and of awe.

Extraordinary respect would lead to the payment of extraordinary honours; and the elevation of heroes into divinities would be attended with little difficulty when time had obscured the real existence of the personages and weakened the remembrance of their actions. The imagination would easily be worked upon while the eye contemplated these first rude attempts at form; and thus men would be elevated into gods.

The oldest idols of Egypt, no less than the monstrous images of the Buddhists and Chinese, were probably, in the natural progress of superstition, the fruits of a similar origin. The general forms once admitted and consecrated, as symbolical of divine attributes, were afterwards, in some instances, preserved from innovation by the influence of the hierarchical institutions; and thus was a barrier raised which for a long period was fatal to the progress of imitative art. We are accustomed to look to the East as the nursery in which art and science had their origin; and it is probable that much in the Egyptian and even in the Grecian religious systems was derived from this source. In the representations of the deities of the Hindus, the human form is frequently combined with the brute,—the union of intelligence and force; and, as we know was the case with the Egyptians, the Hindu artists seem to have been subjected to some limitations and to a prescribed type. In all statues and rilievi that remain, many of which must have been executed at distant periods, there is the same prevailing character of form, expression, and attributes; while out of the immediate pale of their mythological or sacred system they appear to have been less restricted; and some of the sculptures at Ellora and Elephanta exhibit a feeling for composition, and a power of expressing character, which make it surprising that their sculpture never attained higher excellence. The caves that contain the most interesting of these remains are of great extent. They are divided into compartments, or aisles, by ranges of massive columns, closely resembling the heavy proportions found in Egyptian buildings. They are decorated with sculpture relating to various personages of their mythology or to religious mysteries. These are for the most part of a prescribed form and character; but among the deviations from strictly sacred subjects are some of considerable interest owing to the greater knowledge of art displayed in them.

In turning to the inspired writings, we find allusion made to imitative art in the earliest period of history. The Israelites, after the Exodus, are warned against the superstitions and corruptions that had by degrees crept in and deformed their primitive simple forms of worship, and are exhorted to return to a pure devotion, as for instance in the book of Joshua (xxiv. 2, 14, 15, 23).

Rachel, when she left her father's house with Jacob and Leah, carried away 'the images;' and Laban pursued them in order to recover objects upon which he seems to have set a high value. This, we believe, is the earliest notice in the holy writings of the existence of such things, and even here we have no particulars by which any idea can be formed of what they were like or of what materials they were made. That they were small is evident from the circumstance of Rachel being able to carry them away unobserved, as well as from the facility with which they were concealed when Laban 'searched all the tent, and found them not.'

No remains of Hebrew sculpture are known; but as early as the time of Moses they had attained to a considerable proficiency in some of the most difficult processes of art. The setting up of the molten calf, and the making of the brazen serpent, are evidence of this. The earliest recorded names of sculptors are in the Old Testament; Bezaleel the son of Uri, of the tribe of Judah, and Aholiab the son of Ahisamach, of the tribe of Dan. (*Exod.*, xxvi.) They were the artists appointed to make the ornaments of the Tabernacle, and their date is therefore about fifteen hundred years before the Christian æra.

The most careful examination of the site and ruins of antient Babylon fails to discover any remains which illustrate the state of the arts in that celebrated city. The Bible and Herodotus are the only antient records that can safely be trusted to on this subject, and these supply only scanty information upon such minute points as are necessary to make us acquainted with the early practice and subsequent progress of design. Of other antient writers upon Babylon, Diodorus Siculus is the most valuable for detail; but he is not entitled to equal credit with Herodotus, for never having visited Babylon in person, he follows, in this part of his history, the account of Ctesias [CTESIAS], who does not appear to have been a critical writer. Herodotus visited Babylon while it was in a state of tolerable preservation. He speaks (i. 79, &c.) of the 'hundred gates in the walls, all of bronze,' and of the temple of 'Jupiter Belus, which has brazen gates.' In describing this Babylonian temple, he says, 'there is a large golden statue of the god seated, and by it a golden table, and the step of the chair and the chair are of gold.' He alludes also to another statue of solid gold, twelve cubits high, which he says he did not see, but he repeats what was told him by the Chaldæans. Darius, the son of Hystaspes, had designs upon this statue, but he did not remove it. His son Xerxes seized it, and slew the priest who attempted to resist its removal. Diodorus (ii. 9, &c.) describes the riches which adorned the palaces and gardens of Semiramis, consisting of statues of Belus, Ninus, and of Semiramis herself—of sculptures in relief, and painted, representing various animals—of works in gold, in silver, and in bronze, many of which were of large dimensions. Admitting there is much exaggeration in the account of Ctesias, who seems to have attributed all the works spoken of to the time of the most antient Semiramis, there can still be no doubt that the arts of design had at least been practised to a great extent during the antient Assyrian monarchy. Perfection can only be attained by slow degrees, and by successive efforts, and such works as are alluded to by Diodorus, though they are distinguished by the names of the earlier and greatest sovereigns, may more probably be attributed to a later date. There are some curious and interesting particulars respecting the customs of the Babylonians, in dressing up and parading the images of the gods, at a later period of their history, in the complaint of Baruch (chap. vi., 4, 8): 'Now shall ye see in Babylon gods of silver, and of gold, and of wood, borne upon shoulders, which cause the nations to fear;' 'they themselves are gilded, and laid over with gold;' 'covered with purple raiment,' &c., &c. Baruch wrote about B.C. 607.

From the peculiar position held by the Phœnicians, and their character for enterprise and ingenuity, it is much to be regretted that we possess no specimens of their design. The coins of Carthage, a colony of Phœnicia, are of too late a date and of too insignificant a character to throw any light upon the condition of sculpture among the parent people; and we can therefore only estimate their proficiency in all ingenious pursuits from the encomiums so generally passed upon them by antient writers. While the neighbouring people were in a state of primitive simplicity or of profound ignorance, the Phœnicians seem, by a native industry and disposition to exertion, to have made themselves celebrated for their arts and manufactures. Their country was the great mart and magazine of the known world. The prophet Ezekiel apostrophises Tyre as a 'merchant of the people for many isles.'—'The ships of Tarshish,' he says, 'did sing of thee in thy market; and thou wast replenished and made very glorious in the midst of the seas.' Homer (*Iliad*, xxiii. 743) calls them 'the *Sidonians*, the skilful workers or artificers' (Σιδόνες πολυδαίδαλοι), when he speaks of them as having made an elaborately worked silver cup. Solomon sent to Hiram, king of Tyre, for workmen to build and decorate his magnificent temple; and the king sent him a 'cunning' man, skilful to work in gold, silver, brass, iron, stone, and timber. (2 *Chron.* ii. 13; and 1 *Kings*, vii.) The building of Solomon's temple took place about one thousand years before the Christian æra.

With the exception of the Hindus, our remarks have thus far been confined to those nations among whom sculpture is known to have been practised, but of whose art no monuments remain. We are now about to enter upon a more interesting field of inquiry. Sculpture had in its first stage (when, as we believe, each people who employed it originated it for themselves) fulfilled its purpose as a sign or a record. Afterwards it acquired an increased dignity from being used to represent objects claiming admiration or respect; and it was in this stage probably that valuable materials were first used for sculpture. The progress was easy to employing it for decoration, and the Babylonians and Hebrews made great use of it for this purpose. But as yet no practical knowledge has been gained with respect to its progress as an art of design; of the changes from primitive rudeness to defined form and character; nor of the innovations or varieties in feeling or practice occasioned by the intercourse of hitherto strange and unknown nations.

The style of sculpture and the condition of the art at different periods among the Persians, the Egyptians, the Etrurians, the Greeks, and the Romans, can fortunately be illustrated by reference to existing remains. Each of these people had their peculiar manner, which has given a character of *school* to their productions. In all of them the practice of art was more or less influenced by the priests, and by local and popular religious opinions; and it will be interesting to trace how far these influences affected the progress of sculpture, by restraining, as they did in some instances, its advancement towards perfection even as an imitative art; or in urging it forward, as among the Greeks, till it reached its highest excellence, by the union of subject, form, and expression, as a means of gratifying sense, exciting feeling, and elevating sentiment.

Sculpture was practised in Persia with very limited success. Various circumstances conspired to retard its progress. The Persians disapproved of statues for religious purposes; that is, as objects to which worship should be offered. Not believing, as the Greeks did, that the gods had the human form, they admitted no representation of the deity, and allowed fire and water to be the only symbols or emblems of the divine power. It is said that Xerxes destroyed the temples of Greece at the instigation of the Magi, who exclaimed against the impiety of those who presumed to enclose within walls the gods to whom all things are open and free, and whose appropriate temple is the whole universe. Wherever they appeared as conquerors, the effects of this opinion were exhibited; and in Egypt, as well as in Greece, they gave full indulgence to the iconoclastic fury. It is not easy to determine the date of such sculptures as appear on Persian buildings. Those which decorate the structures at Persepolis represent religious processions chiefly, and sometimes combats both of men and beasts. In none of them is there any approach to a representation of the naked human figure. Their figures, enveloped in long heavy draperies, are deficient in grace, variety of action, and character. At a later period of their history some innovations seem to have been permitted, but these were not of sufficient importance to raise their art to any degree of excellence. The low measure of their attainments in this respect, and the general want of taste in art, are strikingly exhibited in the gold coins called *Darics*, which display as much poverty of design as meanness and clumsiness of execution. It has been thought that Persian art received some additions or modifications after the return of Cambyses from Egypt, when he probably was accompanied by some of the artists of that comparatively cultivated nation. There is however nothing in any of the monuments that remain which is evidence of this influence. In the treatment of the termination of the hair in small round shell-like knobs, and in the parallelism and uniformity of the long draperies, there is a strong resemblance between the styles of the Persian and early Greek and Etruscan monuments. If this is anything more than a general characteristic of primitive art, it only proves that the Persians were at one period not far inferior to their neighbours, but failed to make that progress in design and execution which eventually led to the perfection of art in Greece and Asia Minor. Pleased with display and empty parade, the Persians, as a nation, were never eminent for high intellectual acquirements or refined taste. From these remarks it appears that the Persians contributed little or nothing to the advancement of art; and indeed they hardly deserve to be mentioned in connection with the great schools of design. Still, as few collections are without specimens of their productions, it might not be right to omit an allusion to them. Their works are curious as examples of art, but they cannot justly be considered as a link in the chain of its history.

In Egypt, on the other hand, distinct as is the quality of its art from that of Greece, sculpture was practised on a scale and for purposes that give it an irresistible claim to our interest. From all we read in antient authors, and from all that modern research has brought to light (and we are receiving, almost daily, fresh accessions to our knowledge), the Egyptians were learned, intelligent, industrious, and wealthy. Neighbouring nations considered Egypt as the centre and the source of all knowledge; and 'the wisdom of the Egyptians' passed into a proverb. Of the power and the ingenuity of the Egyptians, even in the most archaic times, some idea may be formed from the magnitude and character of their remaining monuments of architecture and sculpture, some of which, of a finished style of art, are considered to be not only of a much earlier date than any known works of other countries, but older than any historical record that we possess. The date of the foundation of Thebes, the capital of Upper Egypt, and of Memphis, the capital of Lower Egypt, is undetermined; but it must be of a very high antiquity. At Karnak (a portion of Thebes lying on the Arabian side of the Nile) there are remains of sculpture which bear the name (Osirtasen) of a monarch supposed to have been contemporary with Joseph; and many of the ruins are attributed by archæologists to a date long antecedent to that king. These monuments are mentioned merely in proof of the great antiquity of sculpture among the Egyptians, and as affording the opportunity of comparing the peculiarities of the style of art at that early time with that of works of later date.

Winckelman, Millin, and Fea have thought it possible to distinguish different periods, or epochs, in the history of Egyptian sculpture; but they have not agreed in their classification. This is not to be wondered at, when the general resemblance of style that pervades all Egyptian design is considered. In the course of ages, and especially under some of the more ambitious and enlightened of their kings, a grander style of form and greater variety of composition were indulged in. Still, the very slight variations that were made (for, considering the space of time over which the history of Egypt, as a flourishing nation, extends, they may truly be called slight) render any attempt at a satisfactory classification, or reduction of changes to chronological periods, almost hopeless. In the arrangements of the above antiquaries, much more importance is allowed to the influence exercised on the arts by Cambyses than is reconcilable with authority. He endeavoured to abolish many of the customs and even to interfere with the religion of the Egyptians; but that he occasioned any change in their style of art is not hinted at by Herodotus or any other antient writer. It must also be remembered that those innovations which the conquests of Cambyses enabled him to introduce were of no great duration, for his successor Darius permitted the Egyptians to return to their own habits and usages; and it is remarkable, and confirmatory of this view that the Egyptians were but little affected by the residence of the Persians in their country, that Plato (*Laws*, ii.), speaking of the strong attachment which the Egyptians had for all their most antient customs, observes that no change had taken place for ages. Plato lived about one hundred and twenty years after Cambyses, so that his testimony on this point is valuable. The only division of epochs of art in Egypt which is not open to dispute is, first, that of an original and preserved standard which, with slight variations and modifications, existed from the earliest date of art in the country down to the time of the arrival of the Macedonian Greeks in Egypt, that is, till about 330 B.C. The Greek dominion in Egypt constitutes the second period; and the style of art may perhaps not inappropriately be called Greco-Egyptian, as it certainly was influenced by the taste introduced by that people. The next and last period may be termed the pseudo-Egyptian, or imitative period; and dates from the time of Hadrian, or about A.D. 130, when the Romans adopted many of the superstitions of the Egyptians, and added some of their divinities to their own extensive mythological calendar. This love of novelty, or subserviency to the caprices of their emperor, filled the cities and villas of Italy with statues of Isis, Osiris, and other personages and objects of Egyptian worship. No advantage however was gained by Egyptian art in consequence of the springing up of this fashion in Rome. The great endeavour was rather to give all design an Egyptian character, than to elevate the character of Egyptian art by the introduction of a superior taste either in form or composition. The most favourable specimen of the mixed style is the fine statue of the Egyptian Antinous, as it is called; but, founded on caprice and false principles, the Roman or pseudo-Egyptian manner soon fell into disuse, and has never been resumed. It will be remarked that in all the changes of circumstances to which we have referred, and by which the political condition of Egypt was materially effected, no sufficient alterations occurred to destroy the peculiar and distinctive character of Egyptian art, which exists in all its force, whether the works be of the most remote archaic period and of the whole range of time to Alexander the Great, of the time of the Ptolemies, or even the still more modern period of Hadrian.

It is indeed matter of surprise that a nation so celebrated as the Egyptians for superior intelligence, and of such long experience in the practice of the arts, should have made so little progress in them; and the phenomenon would be quite inexplicable if we were not acquainted with the nature of their institutions, and the check which was thus opposed to their advancement beyond a certain limit. The common speculations that have been offered with the view of accounting for the acknowledged inferiority of the Egyptians to the Greeks are altogether unsatisfactory, even if the facts upon which they are founded could be admitted. Some have supposed the absence of grace and the stiff uniformity of action in Egyptian design to be owing to the want of beauty in the natives of Egypt. Others have imagined that the artist's want of knowledge of anatomy, and there being no public games in which they could study the human figure, are sufficient to account for this inferiority; attributing to physical causes alone that which was effected by very different influences. The art of sculpture especially seems to have been employed exclusively for religious purposes. The priests, an hereditary body, systematically enforced the preservation of antient usages, and confirmed their hold upon the respect, obedience, and veneration of the people by not suffering any innovation upon old established forms. The whole population was divided into castes, and a calling or profession was exercised from generation to generation. The sons were all obliged to follow the steps of a father. The order of these castes is variously stated by different writers. The sacerdotal of course ranked first. According to Synesius, the profession of an artist was not exercised by common or illiterate persons, lest they should attempt anything contrary to the laws and regulations regarding the figures of the gods; and Plato, in his second book of Laws, says, 'they never suffered any painters or statuaries to innovate anything in their art, or to invent any new subjects or any new habits. Hence the art remains the same; the rules of it the same.' Here then we see the real cause of the duration through a series of years of one unchanged style of art. The origin of the form preserved through so many ages is declared by its extreme simplicity. The earliest attempt at representing the human figure would be marked by the absence of action; and this is the characteristic of all Egyptian statues. The figure is upright, or kneeling, or sitting. The legs are close together, and the arms are attached to the body. This then became the established type: and though some slight movement was occasionally allowed, as in advancing one foot before the other, it hardly can be said to relieve the so improved figure from the stiffness of the more primitive standard. That there was a capability in the artists for mechanical excellence is amply proved by the more elegant forms that sometimes are met with even in Egyptian statues, but more especially in those works where they could without impropriety indulge their fancy. The heads of divine personages occasionally beam with majesty and grace; and in the examples in the British Museum of Egyptian monuments, whether in the head of the so-called Young Memnon, or in the Prudhoe Lions and other representations of animals, or in some of the compositions portraying scenes of active life, the student will perceive that some other cause than want of feeling or skill must have operated to prevent the sculptor of Egypt from arriving at the same eminence in art that was attained by the artists of Greece. The stiff and limited action of Egyptian statues has already been noticed. To this must be added, that the figures of men are usually naked, excepting that a sort of apron is folded across the loins; while those of women are represented dressed in a long and simple garment fitted close to the body. This covering has no folds in it, and can only be distinguished from the figure by a slightly raised border at the neck and feet. The form of the breasts is sometimes indicated on the dress by their natural projection being circumscribed by an indented line. One of the most interesting specimens of Egyptian sculpture is now in this country. It is generally known as the head of the Young Memnon, though it has no claim to that title, which was given it from a mistake made by Norden, the traveller, who visited Egypt in 1737. This bust is formed of a single block of fine-grained granite, containing two strata of colour, one portion being of a red, the other of a grey (or blue) cast. Though it possesses all the characteristics which so eminently distinguish Egyptian sculpture—the flat eyebrows, projecting eyeballs, the rounded nose, thick lips, and the ears placed high up, this head claims admiration for beauty of outline and the peculiar sweetness of its expression. It offers a remarkable exception to the general rule of Egyptian design; and shows, what has before been hinted at, that there was the power of representing beauty both of form and sentiment, if room had been allowed for its exercise. In working basso-rilievo (and pictures) the Egyptian artists decidedly ventured beyond the limitations to which they seem to have been confined in representing insulated figures. Almost all the temples and tombs that have been explored are richly decorated with sculptures in the peculiar style of rilievo to which allusion has been made in the introductory part of this article; and, although they do not materially differ in the general style and character of art, they are sufficiently varied in the mode of treatment to warrant this distinct notice of them. The most striking difference from the insulated figures consists in the superiority as well as extent of design and composition. This is particularly observable in the Theban remains, to which attention has been directed by Wilkinson, Rossellini, and others who have illustrated the history, arts, and customs of the antient Egyptians. Wilkinson, speaking of Luq'sor and Karnak, observes as to the decorations of the temple, 'The principal historical sculptures are on the exterior of the great hall. . . . . . The upper compartment represents the king attacking a fortified town situated on a rock which is surrounded by a wood, and lies in the immediate vicinity of the mountains.' In another compartment the king is again the hero, and is represented slaying the chief of the enemy with his sword, having first wounded him with his spear, and entangled him with his bowstring. The author observes here that the drawing of these figures is remarkably spirited. After other series or compartments, in which the Egyptian monarch is seen scattering death among his enemies, is a representation of his return, and the presentation, by him, of captives and spoils to the deities of Thebes.

All colossal works in Egypt are of basalt, porphyry, granite, or sandstone; though Herodotus (ii. 143) tells us that at Saïs and at Thebes there were statues, of large dimensions, of wood. We are not aware that any large statues have been found made of metal. The British Museum possesses three bronze figures which merit attention as they exceed the usual dimensions of such Egyptian works; being about three feet high, and gilt. The substance or thickness of the metal is not great, and the interior is filled up with stucco or plaster. The gilding, some of which is well preserved, both in surface and colour, seems to have been applied as a wash; the bronze having first been entirely covered with a coat of plaster about as thick as a card.

The clean execution and exceedingly fine surface observable in the sculptures of Egypt has attracted the attention of practical judges; and has led to the conviction that the Egyptians must have had great knowledge in the arts of hardening or tempering metal, to enable them to execute such highly finished works in the most obstinate and brittle materials. It is a remarkable fact that when the colossal head before alluded to as the Young Memnon was placed in the British Museum, and it was necessary to cut some holes in it for the insertion of iron cramps to unite some of the broken fragments, the hardness of the granite was so great that six or eight blows rendered the mason's tools (which were tempered more highly than usual) totally useless.

The facilities that are now afforded the student and public for examining authentic monuments of Egyptian art, in the extensive and valuable collection in the British Museum, render it unnecessary to dwell at greater length upon the peculiarities of that school of design. That their works are wanting in the grace, the flow of lines, and the beauty united with repose, that constitute the charm of the best Grecian sculpture, must at once be admitted; but the simplicity and clearness of intention in their more extensive compositions, and the sublime grandeur, repose, and dignity of their colossal statues, so appropriate to their mystic and religious purposes, will always ensure their being considered amongst the most interesting monuments of past ages.

Etruscan Sculpture.—The Etruscan is the next school of sculpture that claims attention. The history of this nation is involved in great obscurity. The appellations of Tuscan and Etruscan were foreign to them, and Etruria was a Roman term. The more antient name by which they were called was *Rasenæ* ('Ρασηναι). Their later history is chiefly known from their connection with other nations; for, as they either never cultivated a literature, or their writings have perished, there are no direct means of attaining information respecting them; the few inscriptions that are found on their monuments being even less intelligible than are now the hieroglyphics of Egypt. The discoveries that have been made, especially of late years, in the old towns of Etruria, not only of architectural remains, but of tombs and sepulchral chambers, containing vases, arms, armour, ornaments, and paintings, have partially rewarded the diligence and kept alive the zeal of scholars; but though these memorials are of the highest interest as evidence of the ingenuity and the wealth of the former inhabitants of the country, it must be admitted that they have thrown but little light on the main question of the origin of this remarkable people. Even in antient times it was disputed whether the Etrurians were Pelasgians from Greece, Lydians from Asia, or indigenous in Italy; and modern antiquaries have added to these speculations their conjectures as to a Phœnician, an Egyptian, and a Celtic origin. It will be sufficient to mention the names of Micali, Lanzi, Inghirami, Niebuhr, and Müller, among the modern writers on the history of the Etrurians. An examination of their sculpture, as founded on the numerous existing monuments, almost seems to connect them, in a greater or less degree, with the Greeks. Whether the Etrurians at any time possessed a mythology and style of design on which Greek 'myths' and forms were subsequently engrafted, or whether each nation retained principles originally common to both, is not important in this part of our inquiry. The supporters of the more remote antiquity and superior intelligence of the Etrurians have supposed it possible that this people, instead of being taught by them, were at one time the instructors of the Greeks, amongst whom, in consequence of their wars, internal divisions, and other disturbing causes, the arts were neglected, and probably suffered to fall to decay, while Etruria had enjoyed a state of comparative repose, favourable to the advancement of the arts. Among the great difficulties with which this part of the subject is embarrassed, is that of establishing with any certainty the dates of the settlement of Greeks in Etruria. It certainly is remarkable that the cinerary urns found in sepulchral chambers often have represented on them subjects whose meaning is unknown, and which seem to have no affinity at least with the *post-Homeric* Greek mythology; and so far the practice of art and a class of symbols seem to have existed in Etruria, either essentially its own, or, if ever shared with others, so antient that all record of it was lost, excepting as it appears on these older Etruscan monuments.

The history of the known Etruscan school of sculpture is therefore necessarily founded on the character of the majority of existing specimens; and in these the recurrence of similar subjects and personages, resemblance of costume, and the common form of many of the letters of the Etruscan and Greek alphabets, distinctly establish the fact of some communication between the two nations. Lanzi (*Notizie sulla Scultura degli Antichi*) divides the art of Etruria into epochs or periods, and considers the second to be that which was influenced by colonies from Greece; and it is this influence which is so observable in the monuments referred to.

In observing however that all or nearly all the specimens of Etrurian art that have reached our times indicate a connection or intercourse at some period between that country and the Greeks, it may be well to repeat a remark that has incidentally been made in a former part of this history,—to caution the student from too hastily attributing to different nations a common origin of design, from the mere similarity of certain forms and corresponding particulars of execution which may perchance be recognised or discovered in their primitive attempts at art. It must always be borne in mind that this appearance is often nothing more than the general characteristic of all art in its infancy; the same, or nearly so, in Greece, in India, in Etruria, as in all other countries. These mechanical resemblances teach little or nothing. The learned Lanzi has very justly taken the same view of the subject in his observations on similarity of style, and, in combating the conjecture that Etruscan art had been derived from Egypt, another distinguished Italian historian of sculpture, the Count Cicognara, says, 'The supposition that the Etrurians derived their arts and their design from Egypt is unfounded, since, as Lanzi intimates, the hardness or stiffness and straightness of the forms need not to come to us from the Nile: in the first attempts at art among all nations we see the same character: the style or manner being (or showing) not so much art as the absence or want of it.' (*Storia della Scultura*, vol. i.) Lanzi also observes, in speaking of the sculpture of this school (*Notizie sulla Scultura degli Antichi*), that a distinction must be made between works in the Etruscan style and works simply executed by Etrurian artists. The 'Etruscan style' was a peculiar manner of treating art. It was designated by the Latins 'Tuscanicus;' and all works executed in this manner were termed 'opera' or 'signa Tuscanica.' That this distinctive character of school existed, and was recognised as a peculiar feature in art, is confirmed by a passage in Quintilian, in which that writer is particularizing the style of some of the great sculptors of Greece, and showing the changes or progress that distinguished the earlier from the later masters. He says, 'Callon and Egesias made their statues hard' (a technical term meaning stiff and severe), 'and nearly approximating to the Tuscan figures. Calamis made his works less rigid.' (Quint., *Orat.*, lib. xii., 10.) The peculiar characteristics of the Etruscan style,—the *signa Tuscanica*,—are an affectation or exaggeration in the general actions and attitudes, and meagreness of treatment in the details. In the heads, whether of male or female figures, the hair is usually stringy;

plaited, and falling in long tails or lengths. The hands are placed in the least natural position for the purpose on which they are employed, and the ends of the fingers are often turned up in the most unnatural, and therefore ungraceful manner. The draperies are cast without any regard to masses or agreeable forms, and always appear as if they had been put on wet and starched, and had stiffened in drying; the edges are very much shown, and in the falling or perpendicular views appear in regular and corresponding zigzag lines. Many points of resemblance to the above works of the *signa Tuscanica* will be found in early Greek art, especially that of the Æginetan school. With these however this indication of primitive style passed away as the knowledge of art advanced, while the Etruscan manner was retained, and even imitated in many works of a much later period than the original Tuscan, and by artists belonging to schools of a more perfected taste. As a general remark, it may be observed that productions in the Etruscan style are very deficient in beauty. They neither exhibit the repose and simplicity which, notwithstanding its other deficiencies, give dignity to Egyptian, nor the fine forms and sentiment which ennoble Grecian sculpture; and whatever interest they excite is derived rather from the value that attaches to them in an archæological point of view, than from any merit that they possess as works of art.

It has been observed that some Etruscan works are found to differ from these in the style of their execution. This is particularly observable in the recumbent figures that have been discovered in the Volterran and other Etruscan tombs and hypogæa. Some of these are small, but many are of large size, and usually decorate the lid of the coffin, or sarcophagus, in which the ashes and sometimes the body of the deceased were deposited; closely resembling in this respect the style of monumental sculpture in Europe in the fifteenth and sixteenth centuries. In these figures there is a totally different character, both in form and expression, from the true Etruscan monuments. The heads frequently possess great beauty; there is often a strong character of nature in them, and it seems probable that they were intended to be portraits of those whose tombs they surmount. Many of them show marks of having been painted. The age of these works is undetermined. From the locality in which they have been found, and from the inscriptions which they bear, they would seem to belong to remote times of Etruscan dominion. In other respects, as in the general heaviness of the forms and clumsiness of drapery, they call to mind the style of art of a low Roman period; to which time, indeed, some antiquaries have at once assigned them. The question is not unattended with difficulty. There is every reason to believe that the antient tombs of Etruria had been invaded, and in many instances opened and plundered, long before they were rediscovered by our modern archæologists and collectors. It is also probable that many of them have been used as depositories of the dead by a people much more modern than their original constructors. Objects have been found in them of various ages, from which it would appear either that many of the tombs and sarcophagi are really of a later date than usually has been supposed, or that the antient burying-places have been used for the dead of a more modern race.

It is worthy of remark, as it may account in a great measure for the distinctive quality of Etruscan art, that Etruria, like Egypt, was ruled by a powerful hierarchy. Their chiefs, *Lucumones*, were priests as well as temporal rulers, and they may, like their Egyptian brethren, have exercised some influence in directing art, and in preserving from innovation the forms once consecrated by religion. It is at the same time probable that this influence was not so restrictive in Etruria as it was in Egypt; for the varieties that are found in works of art prove that the artists here took greater liberty than was permitted to those of Egypt. This appears to be the most reasonable way of accounting for the continuance of a distinctive style and limited progress of design among a people who were eminently clever (φιλοτεχναι) and ingenious. Considered in this point of view, Etruscan sculpture holds a position of great interest in the history of art. It is impossible not to recognise in it the connecting link between two systems, namely, the practice of art for hieratic or purely sacred purposes, and that more liberal and general development of it which, under the later and more refined Greeks, was directed to the illustration of the most poetical and sublime conceptions through the medium of the most beautiful forms. Of the great extent of their practice in sculpture a sufficient proof is afforded by the fact mentioned by historians, that when, after having sustained long and expensive wars against the Romans, the Etrurians were finally subdued by them, and became a Roman province (about 280 B.C.), two thousand statues were taken by the victors from Volsinii alone. (Plin., *Hist. Nat.*, xxxiv. 7.)

The Etrurians were famed for their skill in making vases, and different towns became celebrated for peculiarities of manufacture. (Plin., *Hist. Nat.*, xxxv. 45.) There is however reason for believing the greater number of painted *terra-cotta* vases, usually called Etruscan, from being first discovered in Etruria, to be Greek. Their subjects, their style of painting and design, evidently connect them with that people; and it has been observed, that though the Etrurians inscribed every other work of art with their own characters, there is scarcely an instance of a painted vase with any other than a Greek inscription. The Arezzo (Arretium) vases are of a fine clay of a red colour, but the figures are in relief: many of these are of a comparatively late period, and bear Latin inscriptions. (Inghirami.) The arrival in Etruria of Demaratus with artists from Corinth has been assigned as the date of the introduction of the art of making vases, and of other processes in the plastic art. It is, however, more probable that they only effected some changes in the style of design that already prevailed; for modern discoveries seem to establish the existence in Etruria of a manufacture of cinerary urns and vases long anterior to the appearance of the refugees from Corinth. (Lanzi, *l. c.*; Winckelman, *Storia della Scultura*; Mrs. H. Gray, *Tombs of Etruria.*)

The Gallery of Antiquities at Florence contains some extremely curious specimens of Etruscan sculpture, especially in some figures of large size in bronze. Some of these have inscriptions on them. The bronze she-wolf, preserved in the Capitol at Rome, is also a remarkable example of antient art in the Etruscan manner. The extensive discoveries that have been made in different parts of Tuscany of late years have likewise added greatly to our knowledge of the Etruscan art and customs, and have enriched the museums of Rome, Naples, Florence, and even England, with most interesting records of this remarkable people. The remains preserved in these and in private collections are well worthy of attention, but a detailed description of them belongs rather to the general history of the country and its antiquities.

The works in sculpture of the Etrurians are chiefly in *terra-cotta*, stone, and bronze; and the most antient tombs have supplied some exquisitely worked ornaments in gold, as well as larger pieces of armour of the same costly material.

Greek Sculpture.—In the preceding pages we have had rather to notice its existence than to trace the progress of sculpture; for, with very limited exceptions, its practice was under circumstances so little favourable for its improvement, that it is scarcely possible to connect it, in any way, with the refined pursuit which it afterwards became in the hands of the Greeks. In other countries it never advanced beyond certain limits; mere representations of objects were produced, seldom elevated by sentiment or feeling; and if, sometimes, the rudeness of first attempts at form was overcome, the art still remained in fetters. In Greece, on the other hand, sculpture soon rose superior to all those prejudices that would have restricted its advancement. With this gifted people it became something more than a merely mechanical pursuit. It was here that the conceptions of sublime and glowing fancies were embodied in the productions of what may truly be termed a race of poet-artists. Writers have endeavoured to account in various ways for this universally admitted superiority of the Greeks over every other nation among whom the fine arts have been practised, and usually have attributed their success to such physical causes as a fine climate, or the prevalence of beautiful forms, or to the public exercises so general in that country; or to the kind of government in those communities in which the arts were most successfully cultivated. Valuable as some of these conditions must be allowed to be towards the perfection of art, they are by no means sufficient to account for an excellence which, even amongst the Greeks, was both extremely partial with respect to locality and extent, and limited as to its duration. Nor were those particular states in which the arts of design most flourished, peculiarly favoured beyond others in the causes supposed to contribute to that excellence. The climate of Attica, it is admitted, was unequal; and though vegetation appeared in the greatest luxuriance in some spots, in others the soil was barren and naked. With regard to beauty, too, there is no reason to believe that the people who most excelled in the fine arts (namely, the Athenians) were distinguished beyond all other Grecians for this quality. Cicero, indeed, makes a very remarkable observation which would go far to prove that the contrary was the fact. He says, speaking of the crowd of young men whom he saw at Athens, how few there were who were really handsome. (*De Nat. Deor.*, lib. ii., c. 79.) And it is curious also that of all the women whose celebrity for beauty has reached us, not one appears to support in this respect the honour of Athens. Phryne was a native of Thebes, Glycera of Thespiæ, Aspasia was born at Miletus, and when Zeuxis, the painter, desired to procure the most beautiful models for his Venus, it is said he produced his masterpiece from the study of seven virgins of Crotona. It is not intended to deny the existence of beautiful forms amongst the Athenians, but simply to show that it is not to this exclusive possession that their success in the imitative arts can justly be attributed. The admiration of beauty amongst the Lacedæmonians is admitted (Ælian, *Var. Hist.*, xiv. 27; and *Athen.*, xii. 12); but the fine arts were not permitted to be practised in Sparta. In other parts of Greece also personal beauty conferred a title to distinction; the priests of the young Jupiter at Ægium in Achæa, those of the Ismenian Apollo, and the boys who walked in procession at the festivals in honour of Mercury at Tanagra, were youths to whom a prize of beauty had been awarded (Paus., vii. 24; ix. 10. 22); but no school of art arose out of this which at any period equalled, or attempted to equal, that of Athens. It is scarcely necessary to allude to the question of government. The arts flourished where the most different forms existed. Corinth held a secondary rank among the cities of art, while Athens and Sicyon were in the first. Indeed, if wealth, pomp, and luxury had been necessary, or alone favourable, for the success of art, it would have been exhibited among the splendid communities of Asia, and not been left to its comparatively tardy development in the small, scattered, and often disturbed states of Greece. It was not to any of these accidents, either singly or collectively, that the perfection of Greek sculpture was owing. It was the principle upon which, among that people, imitative art was founded (and upon which it was practised throughout all its stages), that led to its excellence. The whole secret of the superiority of the best schools of Greece was in their making nature, in her most perfect forms, their model,—the only means by which perfection in art can be attained. As soon as they acted upon this knowledge, their sculpture became almost as divine as their great exemplar.

Judging from their poetry, and from their art, whether in their sculpture or their painting, it would seem that the Greeks had an intuitive sympathy with beauty. The artists seem to have been careful never to lose sight of this principle, by expressing any passion or feeling under forms at variance with the simple laws of beauty. All extremes of expression are studiously avoided, and they appear to have chosen only those subjects for representation which allowed them to keep within these bounds. Pliny (*Hist. Nat.*, xxx. 37) mentions an artist who had an opprobrious nickname in consequence of painting low and common-place subjects; and the Thebans had a law which subjected artists to a fine if their works were inferior in beauty to the objects which they professed to imitate. (Ælian, *Var.*, iv. 4; Junius, *De Pict. Vet.*, ii. 4; Lessing, *Laocoon*, ii., p. 12.) This natural sensibility to the charm of beautiful forms was encouraged and assisted by the habits of the people. The gymnasia, or schools, in which young men were trained to take part in the public games, were frequented by all classes. Statesmen, philosophers, poets, and artists were in the habit of attending them, and were thus accustomed to see the human form in all its varieties, whether draped or naked, or in repose or in action; and while the sculptor was filling his mind with the beauty and capabilities of the human figure, the spectator was acquiring the knowledge that enabled him to become a competent judge of imitative art. The importance attached to distinction in these games rendered the education of the young men a subject of great care. Every means were resorted to in order to increase the elegance, the strength, the suppleness, and the active powers of the body; and the sculptor especially benefited by having constantly before him the finest forms that exact discipline and judicious training could produce. He was thus taught to seek the causes of the superiority of the victor in the race or the wrestling match; and by comparing or contrasting the different properties most generally found to exist in the conquerors in the various classes, to adopt those qualities in whatever characters he might be called upon to represent. The deep and spacious chest and broad shoulders of the brawny wrestler gave the type or distinguishing character of Hercules, and the class in which physical strength was to be exhibited: the clean legs, small well-knit joints, and light proportions of the victor in the foot-race, furnished the character of form of the messenger of the gods; while the union of strength and agility in the athlete, taught the sculptor how to make those combinations which eventually resulted in what is termed *ideal* beauty,—the statues of gods, demigods, and heroes. Having this access to the best models, and exercising his art under the eyes of critics who, from habit and observation, were as well acquainted as himself with his standard, it is not surprising that the sculptor of Greece acquired a facility and a power of representing every class of form unattained by any other people, and which have rendered the terms Greek and perfection, with reference to art, almost synonymous. The high purposes to which sculpture especially was applied, and the general interest that was felt in all works that were produced, accounts for the success with which the art was practised. The mind of the sculptor was enlarged while he reflected on the appropriation of his work and the great objects of his labours. His was not the ambition of present praise or profit. He felt, and truly felt, that his art, properly practised and rightly understood, was capable of producing great moral effects upon those who were to contemplate them; and consequently in the best period of Greek art, the appeal was always made to the higher feelings rather than the mere senses. The artist did not produce his works to gratify a patron, but to improve a people; and whether they were destined to the temple, the grove, the portico, or the place in which the public games were celebrated; whether, like the Jupiter of Olympus, they were intended to excite religious impressions of the majesty of the gods; or, as in the *icones* (or portrait statues) in Altis, to stimulate the energy of the youths of Greece to gain distinction in the public games—the sculptor felt, and he acquired power as he was impressed with the ennobling idea, that he was contributing to a great end. This is the principle of the success of the arts in Greece; and in the presence or absence of this recognition of the public utility of art, may be discovered the causes of its comparative success or failure in other nations and in later times. The most extensive private patronage will fail to produce great results in this respect. Encouragement for public purposes, that is, to incite the public feeling to noble thoughts, or to stimulate to exertion by recording great deeds, are the only means by which an elevated quality of art can be attained. Anything short of this will do, at its utmost, no more than advance mechanical dexterity; often, as has been seen in modern times, and when there has been no want of genius in the artists, at the sacrifice of grandeur of design and good taste.

In Greece, as in other countries, the earliest attempts at imitative art were extremely rude. Pausanias, who travelled in Greece about A.D. 170, mentions that at Pharæ in Achaia thirty quadrangular blocks of stone wero worshipped, or at least honoured, as the symbols or representations of certain divinities. At Thespiæ Juno was thus recognised, and at Sicyon Diana Patroa was represented by a column, and Jupiter Milichius by a pyramid. (Paus., vii. 22; ii. 9.) The antient statue, if it can be so called, of Venus of Paphos, with others that might be referred to, were mere columns or stones set upright. The next step in art was in the attempt to characterise these shapeless symbols by giving them a human form. The upper part was shaped into the likeness of a head, and, by degrees, arms and legs were marked out; but in these early imitations of the human figure the arms were doubtless represented closely attached to the sides, and the legs, though to a certain extent defined, were still connected or united in a common pillar, as in the statues of the Egyptian school.

The history of Greek sculpture may be divided, generally, into four periods, each of which is illustrated by existing works bearing unequivocal marks of the progressive changes which attended the practice of the art from its rise to its decline. These greater divisions or periods might perhaps easily be subdivided into smaller parts; but, as the present object is to give only a general and comprehensive view of the history of Greek sculpture, it seems better to confine ourselves to a few great divisions. The student who desires a more extensive acquaintance with the subject will find ample information in the numerous valuable works that have recently appeared, as well as in the opportunities that now exist of examining the remains of Greek art of all ages which are preserved in the museums of this and other countries. The four principal sections into which antient Greek sculpture may be divided are—the Archaic, or most antient period; the Phidian; the Praxitelian, which includes the period of Lysippus; and fourthly, the age of its decline.

The First period embraces all the uncertain age, of which little is known but what can be gleaned from the traditions preserved in antient writers. It may be considered to extend to the commencement of that great change in the style of art which had its consummation in the school of which Phidias was the head. The Second division includes the period during which sculpture was practised in the grand or sublime style, and during which the scholars of Phidias executed their works on the principles which he taught and illustrated. The Third period is characterised by a more rich and flowing style of execution, as well as by the choice of softer and more delicate subjects than had usually been selected for representation. In this the beautiful was sought after, rather than the sublime. Praxiteles may be considered the first sculptor who introduced this more sensual, if it may be so called, style of art; and Lysippus contributed to advance it by the peculiar fulness, roundness, and harmonious general effect, by which it appears that his works were characterised. The Fourth and last period in this classification is that of the decline of sculpture; when, although the excellence of preceding schools was still admitted and often maintained, not only no advance was made, but artists were frequently led away by the love of novelty of design, or the desire to discover some new road to fame or profit, and neglected the means which ages of progressive improvement had shown to be the best and safest rules of practice. When this was the case, grandeur of style will be found to have given place to littleness, and the beauty and simplicity of general form and character were lost in individuality and minute detail.

The remains of Greek sculpture of the Archaic period are interesting to the antiquary, but they offer very few attractions to the lover of the beautiful. Rigid and stiff in action, and rude and inelegant in form, the statues and rilievi of the infancy of Greek sculpture have very little to distinguish them in these respects from the earlier attempts of other nations. The first step towards a change was in the attempt to give action; and this was soon attended by fresh peculiarities of shape or figure in the parts. In this stage it will be observed that there is great energy or violence in the general design, with a lumpy or knotty character of form. The general proportions of the figures are thick in comparison with the length of parts. The breasts and shoulders are wide or broad, while the hips are narrow. The thighs and calves of the legs are large and heavy for the knees and ankles, and the feet are long and clumsily shaped. The treatment of the head is peculiar in the sculpture of this early period. The eye is usually long and narrow; and is slightly raised at the outer extremity. The mouth is open, and, owing to a slight curve or elevation at the extremities, has the expression of smiling. On the most antient coins the hair is wiry, the lines being parallel and close together, in the apparent endeavour to give the effect of the whole by imitating every hair. This was more successfully attempted by executing the hair in masses; some very antient works exhibit examples of this, where the effect is partially produced by small knobs or lumps. At a more advanced period the hair is executed in a more minute and careful manner, and with a more precise arrangement, combining as it were the particular character of the earliest treatment with the more general effect attempted in the next stage of art. In this the hair is brought in nearly straight lines over the head, but it terminates in small round curls which are arranged with great regularity, and sometimes in two or three rows over the forehead, extending on each side to the temples and ears. Specimens of these modes of treatment occur in the early tetradrachms of Athens; in the heads of the figures in the statues found in the island of Ægina; and in the sculptures found at Selinunte in Sicily, as well as in other remains of small bronzes and early coins; and there are many examples of it preserved in the collection of antiquities in the British Museum. In male figures the beard, wherever it occurs, is wiry, and exhibits elaborate execution. There is a curious specimen of this in the head of a warrior in a group in the Selinuntine marbles above mentioned (and of which there are casts in the British Museum), as well as in the Æginetan marbles. The draperies in the sculpture of this early time are extremely thin, lying close to the figure (or to the ground, if in reliefs), excepting at the edges of the folds, which are sharp and angular; these are arranged with the greatest precision, opposite folds corresponding as nearly as possible with each other, with the edges shown, and terminating in a sort of regular zigzag series of lines. All these peculiarities are characteristic of the most antient, or, as we have called it, Archaic art: and whenever imitations of it have been made in later times, these features of action, form, and treatment of drapery have been observed. Sometimes portions only of the peculiarities above pointed out will be remarked in genuine antient works, but of a later age than that under consideration. The sculptures alluded to as Æginetan offer examples of this; the treatment of the heads being characteristic of an earlier age of the art than the rest of the figures. This is doubtless to be attributed to a feeling of veneration for the older forms and received traditions of certain personages, such as divinities and heroes; and in this respect obedience to prescription marks the Greek as it did the Egyptian and other schools: with the former however it lasted for a limited period only; with the latter it extended throughout their whole existence.

The first sculptors whose names are recorded are Dædalus, Smilis, and Endoeus. We have already adverted to the difficulties that are in the way of establishing a fixed date for the first of the above-named artists, and indeed of distinguishing how many persons were so called. The earliest person called Dædalus was descended, according to the antient traditions, from a royal stock, being grandson of Erectheus, king of Athens. He is said to be the first sculptor who ventured to separate the legs of his statues. He also was the inventor of the saw, the axe, lever, &c. It is impossible to say how much fable and exaggeration have been admitted into the accounts of this remarkable discoverer; and it is equally vain to attempt to distinguish the inventions of the earlier artificers who bore this name, from the improvements introduced at subsequent times by others so called. Dædalus was in all probability a general title, for some time, given to any distinguished mechanist or figure-maker, as figures of a certain style or character were denominated Dædala (Δαίδαλα). Pausanias (ix. 3, &c.) says 'the antients called wooden figures Dædala;' and he adds, that he thinks it likely that the artist was called after the works, rather than by his own name; thus making Dædalus a title or surname. The same author was shown some wooden statues attributed to Dædalus, which he admits were not beautiful, but he says there was in them a certain air of grandeur (ii. 4). Smilis was a native of Ægina, and the son of Euclides. He was said to be contemporary with Dædalus, and he made a statue of Juno at Samos. Endoeus was an Athenian, and a scholar of Dædalus, and, according to antient writers, executed various important works. Pausanias (vii. 5) speaks of a colossal statue in wood of Minerva Polias, which was preserved in his time in the temple of Erythræ in Ionia. It was a seated figure. Other statues by this artist are also mentioned, executed in stone and in ivory.

A mere list of the earlier Greek sculptors can throw little light upon the state of the art; more especially when the existence of many of those whose names are handed down to modern times may fairly be questioned, at least as to the dates assigned to them; and of their skill we certainly possess no authentic examples.

About 869 B.C., Phidon of Argos is said to have struck the first money in Greece, in the island of Ægina. Some extremely rude and simple coins of that island are extant; the device is a tortoise; and from the very primitive style of execution, they are thought not to be very remote from the period alluded to. It has been supposed that the employment of metal for sculpture took place soon after the striking of money under Phidon; and about this time we find mention made of statues of brass or bronze.

Among the sculptors recorded in the annals of art is Gitiadas of Sparta, of whom there were works remaining at Lacedæmon at the time of Pausanias (lib. iii., 17). Gitiadas exercised the profession of architecture as well as sculpture. Learchus also, a sculptor of Rhegium, is placed about this date. Pausanias mentions a bronze statue of Jupiter at Lacedæmon, which was said to be by Learchus, and he calls it the most antient statue in that material known to exist. There are some inconsistencies in the accounts of this artist, and scholars differ in the date which they assign to him. Much of the difficulty in classifying the artists of this time arises from the uncertainty that chronologers have felt in fixing the period at which Dipœnus and Scyllis flourished; but the date here given to Learchus must approximate nearly to the time at which he lived. The next names of importance that occur in the history of art are Telecles, Rhœcus, and Theodorus, to whom sculpture seems to have been indebted for various and great improvements. Their reputation for skill was so high, and their innovations in the practice of art so important, that they were even called inventors of some branches of it, which, however, it is obvious must have been known long before they appeared. Such, for instance, was the case with modelling, or the plastic art, which Pliny (*Hist. Nat.*, xxxv., c. 12), recording without examination all that he read, says was attributed to them; though he himself declares that this discovery was claimed by or given to Dibutades of Corinth. Rhœcus and Theodorus were born at Samos. (Paus., viii. 14.) There appear to have been two sculptors of the latter name; one the son of Rhœcus, the other of Telecles. Rhœcus, architect as well as statuary, is said by Herodotus (iii. 60) to have built the temple of Juno at Samos. He was also considered the author of a statue, of a female, which the Ephesians called Night. It was preserved in the temple of the Ephesian Diana. Pausanias (x. 38) says it appeared more antient than the statue of the Minerva of Amphissa, and was of ruder workmanship, or style of art. This writer tells us that he was unable to find any bronze work of Theodorus; but Pliny alludes to several by an artist of that name. The second, the son of Telecles, was considered the inventor of an art which was rarely exercised by the antients, that of casting figures in iron. According to Herodotus, Theodorus engraved the celebrated ring of Polycrates, tyrant of Samos. Antient story tells us that being warned that his course of prosperity might not always last, he consented to chequer his enjoyments by making some voluntary sacrifice. He threw into the sea this ring, which he valued most highly. In a few days after, a large fish was presented to the king, and, upon its being cut open, the ring was discovered in its belly. (Herod., iii. 41.) Theodorus is said to have made one of two magnificent vases which were presented by Crœsus, king of Lydia, to the temple at Delphi. It has been argued from this circumstance that Theodorus must have lived at a later date than that usually assigned to him. But it is not stated that the vase was made expressly for Crœsus. It is more probable that it was among the treasures of the king, and from its age, the reputation of its maker, and its intrinsic value, might have been thought worthy of dedication. One of the vases was of gold; the other of silver. The latter alone is considered of sufficient importance for the artist who made it to be recorded. The above sculptor is noticed by Pliny for a work of great delicacy and minuteness, a statue in brass of himself, holding in one hand a file, alluding probably to his profession; in the other a *quadriga*, so small that a fly might cover it with his wings. With respect to the dates of the above artists, Pliny says they lived long prior to the expulsion of the Bacchiadæ from Corinth, an event which occurred in the thirteenth Olympiad, about 659 B.C. It is conjectured, therefore, that Rhœcus, and the first and second Theodorus, lived between 800 and 700 years B.C.

The introduction of casting in metal forms an interesting epoch in the history of art, and it is to be regretted that our information with respect both to time and place, that is, the part of the country in which it was first practised by artists of Greece and Asia Minor, is so limited. The fact of Learchus of Rhegium being recorded as one of the earliest statuaries would lead to the inference that the art was known in Italy before it was adopted in Greece.

Some antiquaries place Dipœnus and Scyllis between 800 and 700 B.C., a date which Flaxman (*Lect.*, p. 75, 79) adopts in speaking of these sculptors. Others suppose they lived as late as 540 B.C. They have been called the first artists who employed marble for sculpture (Plin., *Hist. Nat.*, xxxvi. 4), but it is more likely that the expression upon which this opinion has been founded means that they were eminently distinguished for their skill (which may have been extraordinary at the time) in working in that beautiful material. They were employed by the Sicyonians to make for them certain statues of their gods; but we are told that having taken some offence, they quitted Sicyon, leaving their work unfinished. The country was soon after afflicted with famine; and, upon consulting the oracle, the Sicyonians were told that it would cease when the statues of the gods were completed. Dipœnus and Scyllis were persuaded to return, and they finished the statues: they were of Apollo, Diana, Hercules, and Minerva. Among their numerous scholars we find Learchus of Rhegium, which will account for the earlier date that is assigned them. They are also called the masters of Tectæus and Angelion, Doryclidas, Dontas, Medon, and Theocles. (Paus., ii. 32; iii. 17, &c.) Dipœnus and Scyllis were considered the founders of the school of Corinth.

From the earlier time of which mention has been made down to about 550 B.C., there probably was little change in the style of sculpture, although great improvement in execution or mechanical power doubtless attended the extensive practice which the growing admiration of art occasioned. In a country in which all the efforts of genius were justly appreciated, sculptors, who were called upon to represent the most exalted objects, were likely to exert themselves to the utmost to arrive at perfection; and the remains of art afford sufficient evidence that from the time alluded to, that is, between the sixth and seventh centuries before our era, when the first difficulties had been surmounted, the advancement of sculpture was rapid and uninterrupted.

It is not necessary to give a mere list of names of the artists who are supposed to have lived to this time. So much that is uncertain is mixed up with the notices of them that are found in Pliny, Pausanias, and others who refer to them, that the inquiry into their personal history would rather impede than advance our present object.

Up to the period at which we are now arrived, sculpture seems to have been practised most generally and successfully in the Greek colonies of Asia; but the consequences of the revolt against Darius, the son of Hystaspes, were utterly destructive to their further progress. Many of the temples were burnt by the Persians, and the inhabitants were carried to distant places, or were reduced to a state of slavery. But as art fell in Asia, it acquired vigour in Europe, and the artists of Ægina, Sicyon, and Corinth diffused the principles of good taste and the knowledge of art throughout neighbouring countries; a feeling for a grand style of sculpture was soon exhibited wherever any opportunity occurred for the practice of the art.

It is interesting to be able to refer, in illustration of the character of the art at this time, to some undoubted remains of sculpture of a period certainly not very remote from that under consideration. These consist of eleven statues which decorated the western and five statues that stood in the eastern pediments of a temple in the island of Ægina, where they were discovered, in the year 1812, by some English and German travellers. The subject of both series is a battle and the eleven figures of the western side seem to be the full number of the original composition. Minerva, fully armed, her helmet on, the ægis covering her breast, and her shield on her left arm, occupies the centre. This figure is of rather larger proportions than the combatants, and is raised on a plinth, and appears to be presiding over the battle. Immediately in front of the goddess, and extended at her feet, is a dying warrior; another appears advancing towards him as if to protect or assist him, while a third, with uplifted arm in which probably was a spear, seems to rush forward to prevent his approach. The rest of the figures are engaged in various ways, exhibiting great energy of action; the smaller ends of the pediment are filled up with the fallen and wounded. The figures of the eastern side are larger than those of the western pediment.

These sculptures offer many peculiarities. The general style is what has been termed Archaic, but there are varieties in detail, or in parts, which require comment. The statue of the goddess is more rude or antient in style than the figures in action. She is entirely draped down to the ancles; and the feet, raised on sandals, are both turned in profile, as if the figure were standing sideways. The drapery is stiff and arranged in the peculiar zigzag manner before described. The ægis is smooth, but the scales have been either painted or gilded, as remains of colour were found upon it. The edge of the ægis has a sort of border of snakes, and here, as well as in the helmet of this and the other figures, are indications of metal having been inserted by way of terminations or probably ornament. The costume of the various figures that are dressed is highly interesting. The forms of the cuirass, the greaves, and the helmets are evidently most correctly copied; and the greatest care is shown in the fastenings, which appear in most instances to have been made of metal. The dress of one figure, a kneeling archer, is apparently composed of leather. It fits closely and without any indication of folds throughout the figure from the throat to the ancles. His head-dress resembles the Phrygian cap.

In the execution of these sculptures considerable skill is indicated both in the treatment of the marble and in the expression thrown into the forms. Though the details are not always graceful, there is a grand division and breadth of parts; and in the articulations of the bones and the clean execution of the joints there is much to admire. The heads are uniformly Archaic—hard, and dry; with a simpering or smiling expression about the mouths, however opposed to this character may be the action or employment of the figures. The manner of treating the hair in small curls or knobs corresponds with the description before given of works of this period.

The subject represented by these sculptures is still a matter of inquiry; and the learned have not yet pronounced any satisfactory opinion upon it. The figure of Minerva may possibly only be intended for an image of the goddess, and not the goddess herself. The fact of it's being represented of a larger proportion and in a different style from the combatants, favours in some respects this idea. These sculptures, called the marbles of Ægina, are in the collection of the king of Bavaria at Munich; there is a set of casts from them in the British Museum.

The Selinuntine marbles, so called from their having been found at Selinunte, on the site of the antient Selinus, in Sicily, are very curious examples of early art. They consist of fragments of marble alti-rilievi, and seem to have formed part of the decoration of two temples, of which traces still remain. There are some peculiarities about these sculptures which are characteristic of two different styles of art. Those which belonged to one (distinguished as the Eastern) temple, have many points of close resemblance to the style of the Archaic (Æginetan) school, while those of the western temple appear to have come either from a more barbarous hand, or to be of a much earlier date than the others. Without having the sculpture to refer to, it is difficult to explain in what these peculiarities consist, but a comparison of what remains of a head of Minerva, and that of a dying or wounded warrior, with some others of the collection, will suggest the inference we have ventured to draw. The head of the dying figure closely resembles (in character) that of the warriors in the marbles of Ægina; in the other figures there is a greater resemblance to the full overcharged forms described as characteristic of the very earliest art, and approaching indeed in some degree to the works of the Egyptians. At a later period than that to which these sculptures may be referred, the artists of Ægina were invited by the tyrants of Sicily to execute works in that country. It is highly probable therefore that in more remote times, and when art was still less known or practised there, foreign artists should have been employed in furnishing the decoration of the temples of newly founded cities. These artists would be the most esteemed of the time, and the rising school of Ægina would doubtless take a high rank amongst them. Joined with these, or probably working under them, the natives of the country might also have contributed their ruder efforts towards the same important object, and this would sufficiently account for the difference referred to with respect to the style and treatment of the various works.

From about 500 B.C. the succession of the great sculptors of Greece, and the changes that each master and his school effected in the style of art, can be traced with tolerable accuracy. Sicyon and Ægina were the most celebrated schools of sculpture, and unrivalled for the high quality of their bronzes. After Callo, or Callon, a sculptor whose date is very uncertain, the Æginetan artists of the greatest celebrity seem to be Glaucias and Onatas. These artists were much employed by Gelon, the tyrant of Syracuse, and his successors. Onatas, the scholar of Tectæus and Angelion, enjoyed a high reputation, and, judging from the numerous works which Pausanias (lib. vi., viii., ix., x.) attributes to him, must have had very extensive employment. This writer speaks of a colossal statue in bronze of Apollo, which was at Pergamus, the work of this sculptor; likewise a statue of Ceres, which he made for the Phigalians. There were also several works of Onatas at Olympia. One was a colossal bronze figure of Hercules, placed there by the Thasians. For the people of Pheneos he executed a statue of Mercury, dedicated also at Olympia. In this work he had the assistance of Calliteles, who was his scholar, and probably his son. (Paus., v. 27.) Onatas and Calamis worked together on a chariot and accompaniments, which was dedicated at Olympia, after the death of Hiero, king of Syracuse; and in another great work described by Pausanias, we find Onatas associated with Calynthus, showing that it was not unusual, nor considered derogatory to either, to secure the talents of various artists in one work. According to the above-mentioned writer, Onatas was a painter as well as statuary. His performances spoken of in this branch of art were executed for the Platæans: one of his pictures, with a work by Polygnotus, was preserved in the temple of Minerva Aræa. (Paus., ix. 4, 5.) Sculpture was now rapidly approaching towards the perfection which it attained under Polycletus and Phidias; and an event occurred in the fifth century before the Christian æra, which tended to accelerate this progress. This was the disastrous termination of the expedition of Xerxes against Greece. The failure of this vast undertaking showed the Greeks their own strength, while it also exhibited to them the immense wealth of the invaders, and placed in their hands the means of effecting the most costly improvements and decoration. It was customary in Greece to dedicate a tenth of all spoils gained in battle to the service of the gods; and that proportion of what was obtained from the Persians was, as a matter of course, appropriated to that purpose. Its value was expended on the construction of magnificent temples, enriched with sculpture and painting, and ornamented with vases, tripods, shields suspended as trophies, and every variety of decoration. The Persians, in their invading march, had destroyed every temple that they met with; but after their retreat and disgrace, they were all restored with increased magnificence. The ample employment thus afforded for their talents, and the high purposes to which their works were destined, excited a noble spirit of emulation among the artists, whose minds seemed to expand with the greatness of the objects required of them.

The gradual improvement of style in art, from the Archaic period, and through the early Æginetan and Athenian schools, is traced by some of the antient writers. 'The works of Callon,' Quinctilian says (*Orat. Instit.*, xii. 10), 'with those of Hegesias, are hard, and approached what was distinguished as the Etruscan manner. Calamis was less rigid, and the style of Myron, who followed, was still more softened.' In Cicero we find a still more extended list, and a confirmation of the quality of improvement down to a contemporary, as in the above instance, of Phidias, the great master of sculpture. He says the statues of Canachus were more rigid and hard than was agreeable to the truth of nature. Those of Calamis were also hard, but still they were of a softer character than those of Canachus; nor were the works of Myron close enough to nature, though there could be no doubt that they were very beautiful; but the productions of Polycletus, he adds, were still more beautiful, and were truly perfect. (Cic., *De Clar. Orat.*, c. 18.)

The history of the progress of sculpture in Greece has now been carried through the earlier schools, into a period at which it may be considered to have reached its perfection, as far, at least, as regards the principles on which it was practised. The chief sculptors of this age were Hegias, Pythagoras, Ageladas, Myron, Polycletus, Phidias, Alcamenes, and others. Hegias, Egesias, or Hegesias, has been noticed among the sculptors of an improving class, but whose works still gave indication of belonging to the Archaic time.

Pliny distinguishes at least three statuaries of the name of Pythagoras, but although allusion is made in antient writers to artists so called of Samos, Rhegium, and Paros, it appears probable that there were only two of very high reputation. The most celebrated was a native of Rhegium, and the scholar of, or, more correctly speaking, of the school of Clearchus. (Paus., vi. 4.) He executed, among other works, several statues of conquerors in the public games, and he eminently contributed to advance the character of sculpture by his success in giving expression to his statues. Till his time this quality, so indispensable to excellence in art, seems to have been little thought of. A work by him is particularly alluded to for its excellence in this respect: it was a figure of a lame or limping man, in which the expression of anguish was so admirably portrayed, that the spectators were affected, and seemed to feel the pain he was suffering. Pythagoras is also noticed as being the first who represented veins in his statues, and as having bestowed greater care upon the treatment of the hair. From these curious and interesting particulars it is easy to see in what manner the dryness and almost prescriptive character of early art was giving way to the bolder as well as more refined treatment of the Phidian age. Pythagoras may be placed about 480 B.C. He had a scholar called Sostratus. (Pliny, *Hist. Nat.*, xxxiv. 8; Paus., vi., &c.)

Ageladas holds a distinguished rank among the sculptors of antiquity, not only from the quality and number of his works, but also from the circumstance of his having been the master of the three most eminent artists of the brightest period of sculpture, namely, Myron, Polycletus, and Phidias. He was a native of Argos. There is some reason to think that there were two sculptors of this name. Pausanias (iv., vi., vii., and x.) alludes to various statues by Ageladas. He seems chiefly to have worked in bronze.

Myron was a native of Eleutheræ, according to Pliny (*Hist. Nat.*, xxxiv. 8), or an Athenian, according to Pausanias (vi. 2, &c.). There is no artist of antiquity who is mentioned more frequently or more honourably than Myron, and it is scarcely possible to believe that such universal praise would have been accorded if his works had not fully deserved it. It is unfortunate that no known production from the hand of this distinguished artist has reached our times. The only work of which any judgment can be formed is of his famous statue of a Discobolus. Various copies of this figure are believed to exist. The best is in the Palazzo Massimi in Rome. The Discobolus, in marble, in the collection of sculpture in the British Museum, is also believed to be a copy from the same celebrated original. A mere list of the works of this sculptor is unnecessary in this place. A few however may be particularly distinguished, from the peculiar interest given to them by the testimony of antient writers. The Discobolus is especially mentioned and described by Pliny (xxxiv. 8), Lucian (*in Philopseude*), and Quinctilian (*Orat. Instit.*, lib. ii.). This work was very remarkable, considering the date of the artist, for the energy of its action, and the earnest and appropriate expression which pervaded the whole figure. Quinctilian says, 'Quid tam distortum et elaboratum quam est ille Discobulus Myronis.' In this passage the word *distortum* must not be supposed to mean *distorted*, in its usual acceptation, but *varied, removed from the usual and common simple action* given to statues. Lucian refers to the peculiar direction given to one foot, and the effect of the sway or swing of the figure. This peculiarity is observable in the supposed copies of this statue. Another work referred to is a statue of Hercules; also a Satyr contemplating his pipes (*tibiæ*); a Minerva; statues of victors in the games, &c. Strabo (xiv. 637) speaks of three colossal statues at Samos by Myron, of Jupiter, Minerva, and Hercules. Cicero (*In Verr.*, iv. 3, 43) alludes to works by this artist. Pausanias also, in various places, describes his performances in terms of praise. Myron seems also to have had a great reputation for figures of animals, and one of his works of this class, a heifer or cow, is honoured by as many as thirty-six epigrams in the 'Anthologia' (iv.). A dog is mentioned by Pliny, and a calf is also much praised. Propertius alludes to a group of four oxen, which were represented round an altar. The peculiar characteristic of the sculpture of Myron seems to have been expression. Petronius, in spite of Pliny's assertion, leads us to believe that this was the great excellence of Myron; he says, 'Myron qui pene hominum animos ferarumque ære expresserat.' With respect to his style, it seems probable, from some remarks of Pliny, that his works still exhibited certain peculiarities of treatment that belonged to a ruder age, though he gives him the high praise of superiority, in some respects, to Polycletus. He says he introduced more variety into his figures, for this seems to be the true interpretation of the expression of the above writer. 'Primus Myron multiplicâsse varietatem videtur, numerosior in arte quàm Polycletus,' &c. (*Hist. Nat.*, xxxiv. 8.) The works of Myron were chiefly executed in bronze. He used that which was made at Delos, while his rival Polycletus preferred that of Ægina. Though chiefly celebrated for his productions in this material, he worked also in marble, and a statue is mentioned by him of Hecate, made of wood. (Paus., ii. 30.) Myron had a son called Lycius, also a distinguished sculptor.

Polycletus of Sicyon was one of those who eminently contributed to ennoble art, and to carry sculpture to perfection in what has been called the sublime style. In one respect he is said to have been superior to Phidias himself; inasmuch as he was considered to have carried to perfection the *Toreutic art*, which Phidias had only, as it were, commenced. He was the author of that perfect rule of proportion called, by way of distinction, the *Canon of art* [POLYCLETUS.]

The name of Phidias completes, or rather crowns, this list of the great originators of the highest style of sculpture. [PHIDIAS.] The most splendid and the most perfect productions in the art were executed by him, and as long as the principles which he taught were retained, sculpture seems truly to have merited the epithet of sublime. Phidias was called the sculptor of gods; and the majesty of his Olympian Jupiter was declared, in the forcible language of an antient writer, to have added something to the beauty or sublimity of religion. That works of art are capable of exalting the mind, and rendering it susceptible of the most pure and elevated feelings, there can be no question, and this doubtless was the effect produced by the awful grandeur of this far-famed statue. Panegyric has almost been exhausted in recording the merits of the sculptor; but there is no reason to doubt the justness of the honour paid him. Many of his finest productions were in existence when, even comparatively, late writers were living, so that the accounts that have come down to us are not merely the repetitions of unsupported or unproved traditionary encomium. The statue of the Olympian Jupiter was existing till the year 475 of our æra. It was then destroyed by fire at Constantinople; whither it had been transported by the emperor Theodosius the First. Unfortunately no remains of the greater works of Phidias have reached our times; but we have abundant opportunities of judging of his excellence, from the sculptures which, under the title of the Elgin Marbles, form a part of our national collection of antiquities. There is no doubt that these are the productions of this great artist; many of them probably from his own hand, and all executed under his immediate direction. They formed part of the decoration of the Parthenon at Athens, of the building and enrichment of which Phidias had the entire direction. The architects Callicrates and Ictinus worked under him. These sculptures consist of the statues and groups which were placed in the pediments of the temple; of several metopes, in alto-rilievo; and of a considerable portion of the frieze of the cella, in basso-rilievo.

These celebrated marbles have been so frequently and so fully commented on, that it will only be necessary to notice them in this place in their relation to the general history of sculpture, and so far to point out their peculiar character and excellence. The quality for which they are particularly deserving of attention is their truth. The most perfect, the most appropriate, and the most graceful forms have been selected. All that is coarse or vulgar in common forms is omitted, and that only represented which unites the two essential qualities of beauty and truth. The result of this is that happy combination distinguished by the term *ideal beauty*. That no productions of imitative art prior to the time now under consideration possessed this, may be seen by examining the numerous monuments of more antient art remaining to this day: that the productions of the school of Phidias exhibit it in an eminent degree is sufficiently proved in the works above alluded to. The statue of the Ilissus or River God, the Theseus, the Neptune, and the draped groups, though mutilated, are still full of grandeur united with simplicity. When the figure is displayed naked, the nicest knowledge of the human form in anatomy, and capabilities of action are exhibited. The draperies also are treated with the greatest skill, and with the most careful attention to effect. They are plentiful and rich in their masses, and yet so judiciously arranged with respect to the figures, that they do not encumber them, nor prevent the movement and even form of the limbs from being seen. These works are admirable also as fine examples of composition. Although in the bassi-rilievi of the frieze a crowded and busy procession is represented, the utmost skill is displayed in avoiding any unseemly or unintelligible confusion. The perfect acquaintance which the best sculptors of this time had with the anatomy and character of animals is worthy of remark. The skill of Myron has already been alluded to. The horses in the Elgin Marbles are admitted by competent judges to be representations of the finest shape and of the best blood. The commonest observer is struck with their spirited and at the same time graceful action. In short these works may be studied with advantage for every quality that sculpture should possess; for truth, beauty, expression, and composition, united with the purest style and most masterly execution: and they may justly be considered the finest specimens of antient sculpture that are known to exist. [ELGIN MARBLES.]

It may be as well to offer in this stage of the history of the art some observations upon the combination or mixture of materials in sculpture. The custom of using a variety of materials for the different parts of statues, as marble, or stone, or wood for the heads, hands, and feet, and metal for the draperies and accessories, was very general throughout Greece and Asia Minor from a very early period; and although it militates against the received notions of a pure taste, the practice was in full force during what has always been considered the best period of art, namely, the age of Pericles and Phidias. Nor was this mixture of materials the only interference with the simplicity which some have supposed a principle and essential quality of Greek art. The hair of marble statues appears in some instances to have been gilt, and even colour was added to heighten effect. The background of works in rilievo was frequently painted blue, remains of which may still be traced on many antient works. (Kugler, *Polychromie*, &c.; Millingen; Müller.)

The occasional practice of introducing eyes of silver, glass, or paste, has already been alluded to in the introductory part of this essay, in speaking incidentally of Polychromic and Polylithic sculpture. The injurious effect of this introduction of gaudy and sparkling foreign substances upon the higher qualities of any work, such as its composition and expression, seems to be beyond dispute. It may be judged of in wax figures, and in some of the richly dressed and elaborately worked and ornamental images in Roman Catholic churches, and in Hindu temples. No arguments, even when supported by the authority of antient practice, can render such works otherwise than disagreeable as imitative art to any but vulgar minds. An artist of superior power might possibly so treat his work that its expression, the beauty and grandness of its forms, and the scale on which it is executed, might take such entire possession of the spectator as to make him overlook the incongruous mixture of materials: but it is inconceivable that, with their refined taste, extreme sensibility to beauty, and great knowledge of the essentials of art, the Greeks could ever have preferred works of this kind to those of more simple composition. The probability seems to be that the employment of ivory and gold was owing as much as anything to the desire to use the most costly materials, as all the important works so composed appear to have been executed under peculiar circumstances, either as great national contributions, votive offerings in honour of the gods, or as trophies. In the case of tenths of spoils, when vast riches had fallen into the hands of the Greeks, and were devoted to a particular purpose, it was essential to find employment for them in exclusive furtherance of that object; and as the architectural details of their temples were richly ornamented and painted, and even golden shields suspended over the architraves and friezes, it was natural to expend a liberal portion of enrichment on the statue of the presiding divinity. This opinion receives some support from the fact that the practice seems to have been almost if not entirely discontinued as the taste for art for general purposes increased. When we read of exquisite productions by Praxiteles in marble, or Lysippus in bronze, there is no mention of works executed at the same period in the richer materials.

Sculpture in gold and ivory has been called Chryselephantine, from the Greek words χρυσός, 'gold,' and ἐλέφας, 'ivory.' It was not first introduced at the time to which our history has reached, as Pausanias describes works so composed, of a much earlier date, existing in the Heræum, or temple of Juno, at Olympia, as well as in other places; but it was during this period that it was carried to its highest point of excellence. The two most celebrated works recorded in these costly materials are the masterpieces of Phidias. They were, the statues of the Minerva of the Parthenon, and that of the Olympian Jupiter in his temple at Elis. The exposed parts of the figures were made of ivory, and the drapery and accessorial enrichments of gold. Of the enormous value of this kind of work some idea may be formed from the accounts of the antients, that the figure of Minerva was twenty-six cubits high, and that the gold employed on it weighed forty talents. (Plin., *Hist. Nat.*, xxxvi. 5; Thucydides, ii. 13.) One writer says there were fifty talents of gold on it. (Diod. Sic., xii. 40.)

Chryselephantine sculpture seems to have been a branch of what the antients called *Toreutic*. The exact meaning of this term has not been satisfactorily explained. (See *Le Jupiter Olympien*, par Quatremère de Quincy, where several opinions are collected; also *Archäologie der Kunst*, by Müller; Millingen, *Antient Inedited Monuments*, &c.) It was probably used to describe sculpture in which metal, which was worked or chased, was combined with other materials. Pliny says Polycletus brought the art to perfection. (*Hist. Nat.*, xxxiv. 8.)

The antient writers do not furnish any particulars as to the mode of executing these colossal works in materials which sometimes, as in the case of ivory, could only have been supplied in comparatively small pieces. Pausanias (v. 15) tells us that an edifice called the workshop of Phidias, near to Altis, was pointed out to him. It was there, he says, that the sculptor worked each of the parts of the Olympian Jupiter. In addition to the original cost of these productions, there seems to have been great care necessary to preserve them. The Olympian Jupiter was surrounded by a groove or channel of black marble containing oil. The object of this was, first to supply the necessary quantity of moisture to preserve the ivory; and secondly, to secure the work from damp, as the Altis was situated on marshy ground. Means were also adopted at Athens for preventing injury to the ivory parts of the Minerva, from the too dry situation of the Acropolis. We are told that the statue of the Olympian Jupiter was out of repair very soon after its completion; and the fact of the Phædruntæ being established to take care of the work, is a proof of its liability to accident. Pausanias mentions a remarkable circumstance connected with the persons appointed to this duty. It had been entrusted to the descendants of Phidias, and he says that it was in the same family in his time.

The scholars and followers of Phidias were Agoracritus of Paros, Alcamenes of Athens, Colotes or Colotas, Pæonius, and others. The two first deserve notice for the celebrity of their names and works. Agoracritus was the favourite scholar; Alcamenes, judging from the accounts left of him, the most able artist. He was considered second only to his great master; and one author, alluding to the progress made in sculpture, even classes him with Phidias, saying, that what was wanting in Polycletus was to be found in the works of Phidias and Alcamenes. (Quinctilian, lib. xii., 10.)

The sculptures of Phigalia, consisting of a series of altirilievi, representing the battle of the Lapithæ and Centaurs, and of the Greeks and Amazons, are of this age. The temple of which they formed part of the interior decoration was built by Ictinus, the architect, under Phidias, of the Parthenon; and from the style which pervades them, there is every reason to think these compositions proceeded from the same source as the sculptured portions of that edifice. The inferiority of their execution may be easily accounted for by supposing the working out of the designs of the master to have been left to the scholars or inferior artists. These interesting remains have already been more particularly described. [PHIGALIAN MARBLES.] The original sculptures are preserved in the British Museum.

The influence of Phidias continued to be felt for some time. Art had gradually been relieved from the dryness and hardness of the Æginetan school, and Phidias produced out of it the grand character which marks his period; but it appears there was still remaining a severity, both in the forms and in the treatment, in the works of some of the artists of this school, which it was left for a sculptor of a succeeding age to remove. This change, which stamped the character of a new school of sculpture, was effected by Praxiteles.

When the restrictions which originally confined sculpture to religious purposes and prescribed forms had once been disregarded, and the art was applied to represent objects of general beauty and interest, it rapidly underwent changes; and the sculptors of the period which we are now considering, that is, at about 350 B.C., succeeded in introducing an entirely new quality of art. The grand, the sublime, and the severe, gave way to the soft, the flowing, and the graceful. At the head of these innovators was Praxiteles. He worked in bronze and in marble; but his most beautiful and admired performances were probably in the latter material, in the working of which he exhibited the greatest skill, and in which he is said to have introduced processes unknown to his predecessors. [PRAXITELES.] He is supposed to be the first sculptor who ventured to make a statue of Venus entirely naked. Millingen tells us that all statues of female divinities were antiently draped, 'and that Praxiteles was the first who represented Venus naked.' (Millingen, *Monuments*, x., p. 7.) Such an innovation was considered extremely indecorous; but it was excused in this instance, on account of the beauty of the performance. Subsequent artists, desiring to reconcile a mode of representation so favourable to the purposes of art, with the prejudices still existing in a degree in matters pertaining to religious personages, seem to have adopted a middle course, as is seen in the two statues of Venus called of Capua and of Melos. (*Museo Borbonico; Galérie du Louvre.*) In these the forms are left entirely naked down to the middle, from whence rich drapery falls to the ground, covering all the lower portion of the figures.

The next name of importance, as the leader of a new school, is that of Lysippus of Sicyon. The reputation of this artist is not inferior to that of any sculptor who preceded him. He appears to have worked exclusively in bronze; and, according to Pliny, executed as many as six hundred and ten works. A colossal statue at Tarentum by him is much distinguished. Lysippus was the favourite sculptor of Alexander the Great, and had the exclusive privilege of making statues of him. According to some, he executed a series of portraits of this prince, from his earlier years up to his maturer age. A long list of works by Lysippus is furnished by Pliny, Pausanias, and other writers. It will not be necessary to transcribe the catalogue, as a mere list of names will not illustrate the history of the art; but some remarks of the former of these authorities as to the peculiarities of the practice of Lysippus are valuable for the light they throw on the progress of sculpture. He is said to have paid great attention to the treatment of hair, and to have introduced an improvement in proportion, making the heads of his figures smaller than his predecessors had done. He doubtless observed that his figures gained in elegance and effect by taking this liberty; for a saying of his is recorded, 'They (the older sculptors) made men as they were; he represented them as they appeared to be.' This seems to be a paradox; but it is not so, and its meaning and the value of the principle are quite intelligible to artists. It shows that Lysippus considered that very minute detail and close mechanical copying should be made subservient to general effect. Pliny says, 'There is no Latin word to express *symmetria*, which Lysippus most carefully preserved.' The whole passage is curious, and proves that there was a quality about the style and practice of Lysippus which caused all he did to be highly valued. It is said that the emperor Nero commanded that a statue by Lysippus which was at Rome should be gilt; but it was found that its beauty was so impaired by it, that the gilding was removed; and Pliny adds, 'it was more valuable without it, notwithstanding the scratches and cuts which remained after this process.' Lysippus left several scholars, three of whom, his sons Daippus or Laippus, Bedas, and Euthycrates, are mentioned amongst the most eminent of his successors. The last is said to have imitated the firmness, or the austerer parts, of his father's practice, rather than his more elegant and pleasing qualities. 'Therefore,' says Pliny (*Hist. Nat.*, xxxiv. 8), 'he succeeded admirably in a statue of Hercules, at Delphi,' &c. There is a fine bronze statue of Hercules in the Townley Gallery in the British Museum, which has every indication of being of this school.

The perfection of sculpture seems to have been attained under Praxiteles and Lysippus. They were contemporary, and each effected in his way what was before wanting to its completion. It is believed that there are imitations of some of the works of Praxiteles in the various modern collections of sculpture. Among these are the Sleeping Fawn, at Munich; the Cupid of the Vatican, at Rome; statues of Venus, believed to be copies of the far-famed Venus of Cnidus; and the Apollo Sauroctonus, at Rome.

The death of Alexander the Great (324 B.C.) was followed by the dismemberment of his vast empire. The arts suffered in some measure by these divisions and contentions; but it is difficult to assent to Winckelman's opinion, that after the death of that prince there was nothing left except a class of mere imitators. Each of the artists above mentioned left numerous scholars, who still preserved the high character of sculpture by their own successful practice. Among the most distinguished of these sculptors are Cephisodotus and Eubulus, the sons of Praxiteles; Pamphilus, his scholar; the before-mentioned Daippus, Bedas, and Euthycrates, the sons, and Tisicrates, the scholar, of Lysippus; (the works of the latter are said to have been so excellent that they were often mistaken for those of Lysippus himself); Xenocrates, who also wrote a treatise on his art; Chares, the Lyndian, the author of the famous Colossus of Rhodes; Dameas, Eutychydes, and Phœnix. Hermocles of Rhodes is mentioned as having been employed by the earlier Seleucidæ. Isigonus, Pyromachus, and Stratonicus illustrated by their art the victories of Attalus and Eumenes over the Gauls; and the Ptolemies also for a time were protectors and patrons of artists. To the above names many others might be added, sufficient both in number and talent to warrant the belief that sculpture was not only still encouraged and practised on the best principles, but that there were artists living quite capable of aiding its progress by their own genius. The assertion therefore of Pliny (xxxiv. 8), that from the 120th to the 155th Olympiad the art was almost extinct, seems utterly groundless. To this or about this period antiquaries have attributed some of the most interesting remains of antient sculpture that have reached our times. Amongst these may be noticed the well-known statue of the Hermaphrodite, at Paris; the fine fragment called the Torso of the Belvedere, at Rome; the Hercules, called the Farnese, at Naples; and the statue called the Fighting Gladiator. To these some have added the group called the Toro Farnese, at Naples, representing Dirce, Zethus, and Amphion with the bull, and even the group of Laocoon and his sons.

The fatal blow to the existence of the arts in Greece was given by the success of the Roman arms. Lucius Mummius had been sent by the senate against the Achæans. He engaged the Greek army near Corinth, the principal city of the famous Achæan League, and completely defeated it. The city was immediately devoted to destruction, and sacked by the conquerors. The Romans carried away from this celebrated seat of the arts, as well as from the other cities of Greece which fell into their hands, the greater part of the fine productions both in painting and sculpture, which had been accumulated for centuries. These were forthwith transported as spoil to Rome, which became filled, for the first time, with the most splendid monuments of Grecian taste and genius. This event occurred in the 158th Olympiad, or 146 B.C. Athens, which may be considered as the great centre of art, and the favourite asylum of the most distinguished artists of Greece, had suffered a variety of fortune since the time of Pericles, when her glory may be said to have been at its zenith. Her political importance declined from about that period, but she still seems to have maintained a character as the abode of literature and of art long after her political influence was at an end. At length she was doomed to share, in full, the calamities and humiliations to which other Grecian cities had been subjected by the victories of the Romans. Having vainly endeavoured to impede the progress of the Roman army into Greece, Athens had to submit to what she might fairly consider a barbarian conqueror. In the year 86 B.C. she received as her master the haughty and unrelenting Sulla. The history of antient sculpture in Greece may be said to close at this time. After the establishment of the Roman empire, the Greeks no longer had either the higher inducements or the means to carry on the exercise of the arts in what may be considered their native country; and their professors were driven to seek employment and an asylum among their conquerors.

The greatest influx of Greek artists into Italy occurred when Augustus had obtained the sovereignty, though earlier than this period there had been some efforts made by individual Romans to introduce a taste for art among their countrymen. A slight general view of what had been effected in this respect, or rather, of the means used to effect this end, will not be out of place here, as introductory to the examination of what has been called Roman sculpture; but the art never appears to have been naturalized among the people, and, as will be seen, it was always rather an exotic in Rome, nursed and tended by its own natural cultivators, Greek sculptors, than a growth brought to any perfection by the people in whose stranger soil it had accidentally, and almost forcibly, been planted.

Roman Sculpture.—It is not easy to determine when the Romans began to pay attention to the arts of painting and sculpture. For a long period they were too much occupied in insuring their safety and strengthening and extending their state, to think of arts which they could then only have looked upon as unworthy of a warlike people. Their first public monuments were doubtless trophies. The trunk of a tree, stripped of its branches, and bearing the arms of the vanquished, proclaimed the achievement of the victor, and at the same time incited the young Roman to exertion in his country's cause. The sculpture mentioned as existing in Rome at a very early date was, there can be no doubt, of foreign growth, the production of their neighbours the Etrurians; and the celebrated she-wolf still existing in the Capitol, one of the most antient and interesting monuments, whether considered historically, or as an example of early bronze sculpture, may fairly be attributed to that people.

It is recorded that after the victories of Camillus and Mænius over the Latins, equestrian statues were erected in Rome in their honour. This was above 350 years before our æra, or about 400 years after the building of Rome. In the third century B.C. one of the Fabii devoted himself to the arts, and acquired, from his success, the surname of Pictor. Pliny (*Hist. Nat.*, xxxv. 4) says that he decorated with his paintings the temple of the goddess of Health at Rome, and that the pictures existed in his time. A bronze statue of Apollo, made out of spoils taken from the Samnites, is said to have been dedicated in the Capitol about this period. After the conquest of Syracuse by Marcellus, Rome became enriched with the spoils which fell into the hands of the victors. The reply of Marcellus, when he was accused of rapacity for stripping the conquered city of its works of art, is remarkable: he declared he had done it in order that the public edifices of Rome might be ornamented, and also to introduce among his countrymen a taste for the arts and elegance for which the Greeks were so distinguished. The power and greatness of Rome were now being extended in all directions; and, by some caprice of fancy, generated probably by the facilities that were offered for its gratification, it became a rage to collect specimens of sculpture. Where however temples were ransacked simply with the object of enriching the treasury of Rome, as was the case with works in the more costly materials, or to gratify the soldiers, or, as sometimes appears, to swell the triumph of a general, the finest works were little likely to induce a love for refinement among the Romans, or excite any admiration of such objects for their merits as works of art. Notwithstanding the opportunities thus offered for acquiring some knowledge of the beauties of art, from the mere habit of having the most exquisite examples of sculpture brought before them, it does not appear that any decided taste discovered itself till about 66 years B.C. Sulla, in his victorious march through Greece, destroyed several of the most magnificent temples and monuments of that country; but he also collected a great quantity of spoil, which he forwarded to Rome, and which consisted chiefly of the fine works which were preserved in the temples or adorned the public places. This enormous accumulation of such objects seems at length to have aroused in the Romans some feeling of admiration favourable to the existence, at least, of art in their own country. The fashion, or rather passion, to form collections at any price increased. Verres is handed down to posterity among the most zealous and at the same time the most lawless of dilettanti; but the character of the works he possessed, several of which are mentioned by Cicero in his celebrated orations against the rapacious prætor of Sicily, give him a claim to be considered fully capable of appreciating excellence in art. The means that he adopted for gratifying his taste merit the severest condemnation; but he probably preserved from neglect and destruction many of the most valuable monuments of sculpture.

In the last century before Christ various sculptors of distinguished name were resident in Rome, or were practising their art in other parts of Italy. Among these may particularly be mentioned Pasiteles, Arcesilas or Arcesilaus, the author of a group of boys with a lioness; Saurus and Batrachus, Strongylion, Olympiosthenes, and Evander. Arcesilaus was much employed by Lucullus. Strongylion is honourably mentioned for a fine statue of an Amazon, so beautifully formed in the legs that it was called Eucnemos. He also made some statues of Muses; and Pausanias, who alludes to them, adds he was most skilful in his representations of animals. Olympiosthenes also executed three Muses. Pliny speaks in the highest terms of the merit of Pasiteles. He became a Roman citizen, and among his works is mentioned a statue of Jupiter, of ivory, which was placed in the temple (*æde*) of Metellus. It is to be regretted that a literary work of this artist, mentioned by Pliny, no longer exists. He says, 'Pasiteles wrote five volumes containing descriptions of the most remarkable works in the whole world.' Such a record from an artist of the character of Pasiteles would be a treasure.

Among other fine works in sculpture which are supposed to have been produced in the earlier part of this period, may particularly be mentioned the statue known as the Germanicus of the Louvre. It doubtless is intended for a figure of a Roman; but it seems to be agreed that it cannot be a portrait of the prince whose name it bears, but is of an earlier date. On the pedestal, immediately under the falling folds of the drapery, is a tortoise. As this animal was sacred to Mercury, the god of eloquence, Visconti conjectured that the statue might represent some distinguished Roman orator. A Greek inscription declares it to be the work of Cleomenes, the son of Cleomenes the Athenian; a name distinguished among those who illustrated Greece during the prosperous times of sculpture. The names of Apollonius of Athens, and of Glycon, also an Athenian (the sculptors, according to the inscriptions on the works, of the celebrated Torso and of the (Farnese) Hercules), do not occur in Pausanias; which has occasioned a doubt whether they had executed many works remaining in Greece in the time of that writer. They are thought to have lived in the century before our æra.

Julius Cæsar gratified his taste for the fine arts by collecting statues, gems, and similar objects. His patronage extended itself even to remote places, and he not only embellished Rome, but many cities of Gaul, Spain, Greece, and Asia Minor participated in the advantages of his good taste.

A great impulse was given to the encouragement of sculpture by Augustus. He caused all the finest works that could be procured to be collected, and he had them placed in the public places of Rome. He is also said to have removed the statues of illustrious men from the area of the Capitol to the Campus Martius. (Suet., *Calig.*, 34.) The example of Augustus was imitated by the wealthy Romans, and no expense was spared in adding new and admired productions to the different collections of statues and paintings. Among the most liberal of the patrons of this period, Agrippa stands pre-eminent for the munificence with which he devoted his fortune to the embellishment of Rome. The Pantheon is a monument of the taste and princely liberality of a Roman citizen. Agrippa employed an Athenian sculptor, called Diogenes, to enrich this temple. Pliny particularly alludes to some Caryatides by him, as well as to some figures in the pediment or front (*fastigio*); but these Pliny (*Hist. Nat.*, xxxvi. 4) says produced less effect, owing to the height at which they were placed. It is recorded that Agrippa constructed some aqueducts, which he decorated with three hundred statues in bronze and marble. During the age of Augustus the names of many very distinguished artists occur. Among them, Vitruvius, the architect, Posidonius, a native of Ephesus, and the celebrated Dioscorides, the engraver of gems, may be particularly mentioned.

The good effect of the example of Augustus seems to have been long felt in Rome, though it does not appear that Tiberius contributed much to preserve or nourish a taste for art. A circumstance however is said to have occurred during this latter reign which shows that the Romans were alive to the value of fine public works. Tiberius admired a statue representing an athlete anointing his limbs, by Lysippus, which stood in the baths of Agrippa—a place, it seems, of public resort. Desiring to have exclusive possession of this work, he had it removed to his own palace; but the dissatisfaction of the people was so great, and their indignation at the emperor's depriving them of what they considered public property so violently expressed, that Tiberius, fearing a revolt, ordered the favourite statue to be replaced in its original situation.

Caligula had works of art brought to Rome from Greece, but it does not appear that he had any admiration of them as objects of beauty or as memorials of an enlightened people, but rather that he considered them as means of gratifying his personal vanity. He ordered the heads of the gods and of illustrious men to be struck off their statues, and his own to be substituted. This paltry ambition, which could be exercised at a cheap rate, accounts for the mutilation of many statues that have reached our times, and in which a totally different character will often be observed in the heads and other portions of the work. Caligula is recorded as the first emperor who was guilty of this species of sacrilege; but he appears to have been imitated by many of his successors. It is a curious fact that notwithstanding the efforts so unworthily made by Caligula to make himself known to posterity, portraits or busts of this emperor are extremely rare. Among the celebrated works which Caligula desired to have transported to Rome was the famous Olympian Jupiter of Phidias; but the idea was relinquished in consequence of the report of the architects that it would not be safe to move it. The reigns of Claudius and of Nero at first gave promise of encouragement to the arts; the latter emperor required decoration for his Golden Palace, which he constructed on the Palatine Hill; and although the vast number of works that had already been procured from Greece would seem to have robbed that country of all its treasures, he procured no fewer than five hundred bronze statues from the temple of Apollo at Delphi. Two of the best works of antient sculpture, the Apollo Belvedere and the so-called Fighting Gladiator, were found among the ruins of a villa or palace of Nero at Antium. Winckelman has conjectured that these statues may have formed a part of the collection, above spoken of, from the temple of Apollo. It is the opinion of some distinguished artists that the Apollo is an antient copy from a bronze original; and its date has been placed in the Augustan age. The argument for the original having been in bronze is founded on certain technical peculiarities of treatment, which, it is thought, indicate the fact of its being the conception and work of a sculptor in metal. The question of the date of the execution of the existing statue is still undecided; but the very close resemblance or identity of its material with the marble of Luna is considered to be strong evidence of its being a work produced in Italy. (Thiersch, *Epochen der Bildenden Kunst*, p. 312, 2nd ed.) Zenodorus the sculptor was employed by Nero to make a colossal statue of him, of bronze. One account says it was a hundred and ten feet high; another, one hundred and twenty. (Plin., *Hist. Nat.*, xxxiv. 18; Suet., *Ner.*, 31.) Zenodorus was called to Rome from Cisalpine Gaul, where he had executed a colossal statue of Mercury, a work which had occupied him ten years. Menodorus, an Athenian sculptor, lived at this time. His statues of athletæ, and subjects of that class, are mentioned in terms of commendation. It is probable that there were two artists of this name.

This may be considered the period at which the introduction of variously coloured marbles in statues became the fashion in Rome. The Roman *polylithic* sculpture differed in some respects from that practised by the Greeks. The Roman mode was to imitate the different stuffs of which real draperies were composed, as well as the ornamental dressings of the figures, with marbles (usually Oriental alabasters, &c.) closely resembling them in colour. The Greeks occasionally used different materials, not often marbles, for this purpose; but not with the intention of imitating the particular colour or texture of the object represented. The Romans carried this so far as to express, in white and dark marble, the colours of the eyes in a statue, in black marble, of an Ethiopian. More than one example of this may be seen in the various collections of antient statues. The reigns of Otho, Galba, and Vitellius were too short and too disturbed to give those emperors time or opportunity to encourage sculpture. Otho ordered a large sum, ninety millions of sesterces, to be appropriated for the completion of the Golden Palace of Nero. Busts of these emperors are extremely rare. There is one of Vitellius in the Museum of the Louvre, of very high merit; but most of the portraits of this prince have been considered modern.

Vespasian, Titus, and Domitian encouraged sculpture. Titus erected two statues, one of gold, the other equestrian, of ivory, in honour of Britannicus, the son of Claudius, who was poisoned by Nero. (Suet., *Tit.*, 2.) Statues of Domitian are rare, in consequence of the order issued by the senate, after the tyrant's death, that all statues of him should be destroyed.

But little now occurs in the history of sculpture worthy of notice till the time of Trajan. The taste and energy of this prince reanimated the arts both in Greece and Italy. Zeno of Aphrodisias was a sculptor of this time. The column of Trajan is an interesting monument of the art in the latter part of the first century after Christ. The reigns of Trajan, Hadrian, and the Antonines may justly be accounted the golden age of sculpture in Rome; though even then it is probable that the art was little practised by native artists. In Hadrian especially the arts found a munificent protector. He restored many of the antient temples which were falling to decay; he erected others in a style worthy of the best ages of the art; and, among other public-spirited undertakings, completed the temple of the Olympian Jupiter at Athens. [ATHENS, p. 11.] Among the enrichments bestowed upon it was a statue of Jupiter in gold and ivory, several other works placed there by Hadrian, and finally a colossal statue of the emperor himself. The scale of magnificence in which this prince indulged may be estimated from the remains of his celebrated villa near Tivoli, about eighteen miles from Rome. It was embellished with all the finest works that could be procured, whether the productions of antient Greek artists or of those of his own time. Some of the most interesting and valuable remains of antiquity have been discovered there; and even at the present day every fresh excavation that is made among these ruins restores to the world some object of interest. Some of the Egyptian superstitions having been introduced into Italy about this time, they were mixed up with the existing forms of worship, and the gods of the Nile were admitted among those of the Romans. The example of the capital was soon followed by the smaller communities; and as the new worship was extended over the whole empire, a great demand arose for statues, and other symbols of Egyptian deities and ceremonies. The imitations of Egyptian figures and subjects which are found in Italy, and which particularly abounded among the ruins of Hadrian's villa, may be assigned to this period.

The numerous specimens of sculpture of the time of Hadrian that are preserved in modern collections are evidence of the high state of the art. The statues and busts of himself, and of the emperors who immediately preceded and followed him, as well as the portraits of Antoninus and Lucius Verus, exhibit qualities that would do honour to the best ages of Greek sculpture. There are two statues of Antinous in the museum of the Capitol, one treated in the Greek style, entirely naked, and the other with Egyptian attributes, which are particularly worthy of notice for the simplicity and beauty united with grandeur that pervades them. They carry us back to the very finest period of the practice of the art.

Sculpture declined after the death of Hadrian. The difference observable, both in style and execution, in the two columns of Trajan and Antoninus, exhibit a marked change in the condition of art, even in the short period that elapsed between the execution of these works. Antoninus Pius was not however neglectful of art; but the chief employment of that time seems to have been in portraits and busts, a sure indication of indifference towards the higher class of design.

Herodes Atticus claims a distinguished place in the list of promoters of the fine arts. He employed his immense wealth in embellishing Athens and other cities of Greece. Chryselephantine sculpture was still practised; for it is recorded that he caused a quadriga, with a group of Neptune and Amphitrite, made of gold and ivory, to be placed in a temple of Corinth. By the time of Septimius Severus (about A. D. 200) the arts of design had rapidly declined. The schools for their cultivation, which had been established by Hadrian, were no longer kept up, and the effect of the neglect of pure design is visible in the monuments of the period. The sculpture on the arch of Sept. Severus, in the Forum of Rome, as well as that called the Arch of the Goldsmiths, also at Rome, offer undeniable evidence of the low condition of taste, and the inferiority of practice in art. Considerable care was shown in the littlenesses of execution; but everything that indicated boldness of conception, breadth of treatment, and style, had vanished. With the exception of busts, some of which must be admitted to have great merit, the monuments which remain of the time of Caracalla, Geta, Alexander Severus, and their successors, only confirm the rapid fall of sculpture. Alexander Severus endeavoured to revive a taste for architecture, and even instituted schools for the education of students; but the calamities that disturbed Italy during the contentions for the empire, left men little leisure for elegant pursuits. The degraded state of sculpture in the third century of our æra is sufficiently declared by the quality of the bassi-rilievi on the arch of Constantine in Rome. Those which are of the date of the erection of the arch exhibit the utmost poverty of design, with feebleness of execution; but it is well known that the greater part of the sculpture was taken from an arch erected in honour of Trajan, to commemorate his victories over the Dacians and Parthians. The appropriation, on such an occasion, of sculpture executed for another purpose, and at a distant period, offers very conclusive evidence as to the state of art in Rome at this time. It is probable that there really were no sculptors then living to whom it was expedient to entrust the decoration of a work of that description. Indeed, wherever it was absolutely necessary to introduce any work of design of the time, there is ample proof of extreme deficiency in all the requirements of art.

The dismemberment of the Roman empire by the establishment of a seat of imperial government at Constantinople, was a fatal blow to the grandeur and magnificence of Rome; and from this time may be dated the downfall of the city. At the time when Constantine succeeded to the purple, sculpture, as already observed, had fallen into a very low state, and events hurried on its complete degradation. To Constantine himself some honour is however due for his endeavours to restore a feeling for the arts, by the scale on which he proposed to decorate the new imperial residence. Sensible of the want of artists capable of doing justice to his splendid conceptions, he instituted schools, especially for architecture; and, by distributing rewards and giving privileges to students, he endeavoured to induce young men to devote themselves to acquiring a knowledge of the art. He so far succeeded that several considerable buildings were erected, but they were indebted for their decoration to the sculptors of a past age. By the emperor's commands the cities of Greece and Asia Minor were despoiled of what had been left them by preceding collectors. Statues of gods, heroes, sages, and poets were brought together from all parts, to contribute to the splendour of the new city, and nothing, Cedrenus observes, seemed wanting, but the souls of the illustrious individuals whom these admirable monuments were intended to represent. Some attempts were made to restore sculpture by giving employment to contemporary artists; and statues in metal were erected in this reign and in the subsequent reigns of Constantius, Theodosius, and Honorius; but the spirit of antient art was lost, and these works, of a totally distinct character from that of the finer Greek schools, appear to have had so little merit, that the names of their authors have not beon recorded.

The state of Italy in the fifth and sixth centuries rendered the restoration of the fine arts utterly hopeless. During this unhappy period of her history she suffered from the inroads of the northern nations. In the year 412 Alaric, king of the Goths, ravaged the country and gained possession of Rome. At a later period the city was given up to pillage by Odoacer; and Genseric and his Vandals subsequently added to the destruction. In 545 Rome was attacked by the Goths under Totila; they set fire to the city, which continued burning for several days. In this siege, the Romans, driven to their last hold, defended themselves from the Mausoleum of Hadrian (now the Castle of St. Angelo); and, we are told, threw down upon their enemies the statues which decorated that sumptuous edifice. To the losses occasioned by these and similar means are to be added those consequent upon the anti-pagan zeal of some of the early Christians. They used to drag down the statues of the divinities of the Greek and Roman mythology, and pound them to dust. The finest productions of the greatest masters of sculpture were thus demolished; and so sweeping had been the destruction, that when Arcadius and Honorius issued fresh edicts for carrying on the work of demolition, it was said, 'Si qua etiam nunc in templis fanisque consistunt' ('If indeed there should be any still left in the temples').

The greatest treasures of art were preserved at Constantinople, and the palace of the Lausi boasted one of the finest collections of antient statues. An immense number of these fell a prey to the flames in 479. In the year 661 Constans was driven from Constantinople by the infuriated people, and passed over into Italy. He visited Rome, where he remained a few days, but in this time he despoiled it, as far as he could, of whatever it still possessed of value in art. These works, chiefly in bronze, were carried by his orders to Syracuse, where he proposed to establish himself, and where he died.

The public attention both in the Eastern and Western empire was now too fully occupied with intestine troubles and the attacks of external enemies, to be able to think of the arts. The fury of the Iconoclasts and the conquests of the barbarians forwarded the work of destruction, and though Theodoric, and afterwards Charlemagne, attempted to stop the ravages which were consequent upon the successes of their followers, and to afford some protection to thé remains of antiquity, their influence was quite inadequate to effect their object or to save the monuments of genius from the violence of an uncivilized and ill-disciplined soldiery. Theodoric (about 500 A.D.) laments, in a letter to Symmachus, the ruin of works of genius, and observes that Rome still possessed a population of statues. Charlemagne formed the plan of renovating art, and most probably would have accomplished his object, if the age had been worthy of the emperor. His great purpose however was to obliterate the remembrance of the splendour of paganism by the magnificence of Christian art; and the entirely new feeling introduced occasioned a totally new stylo of design, which, as it has little connection with our present subject, will be considered in another place.

The Empire of the West and the glory of the Roman name had passed away. The resuscitation of art and science belongs to another period of our history.

We still watch, with interest, the existence of some of the masterpieces of Grecian sculpture preserved at Constantinople: but even these were destined to destruction, and in no short time shared the common fate.

In the twelfth century Constantinople, after a series of distresses and difficulties, was taken possession of by the victorious Latins and their allies under Boniface and Baldwin; and the city, which had already been nearly destroyed by a succession of fires, was given over to pillage. Nicetas Choniates has described some of tho fine remains of art that were there in his time, and which, during this reign of plunder, were broken or melted down to be coined into money, or sold for the value of the metal. Among them we find various bronze statues of charioteers that stood in the Hippodrome; a group of Bellerophon and Pegasus; Paris presenting the apple to Venus; an exquisite statue of Helen; a colossal Hercules, by Lysippus; and the celebrated colossal statue of Juno, which had once adorned her temple at Samos.

The real history of antient sculpture may be said to have ended even before the period to which it has here been carried. It is both unsatisfactory and painful to attempt to trace it farther, when each step taken only shows ruin and devastation. The monuments of the Romans are numerous, and have been useful in illustrating antient writings and in making us acquainted with the manners and customs of that people; but Roman sculpture has not the same claim upon our attention as that of the Greeks. Indeed in following the history of the art in Italy it is obvious that the interest is chiefly kept up by considering sculpture in Rome as a continuation of that of Greece, and not as an art which the Italians cultivated with any original feeling. The best works produced were by Greek artists; and the attempts of the Romans are characterised, if it can be called character, by poverty of invention, meanness of design, and for the most part unskilful execution. The art was seldom patronised but when it was required to flatter the pride or please the vanity of individuals by portrait statues or busts; and consequently it never rose to that excellence or elevation which it attained in Greece, where it was made the means of embodying the grand conceptions of genius by the union of expression and sentiment with the most beautiful forms.

Revival of Sculpture.—After the subjugation of the Greek and the division of the Roman empire, the fine arts gradually declined. Occasionally efforts were made to revive them, but as these arose from individual feeling, and were not supported by any general interest in the subject, the attempt had little success. Charlemagne endeavoured to restore them; but his edicts, unresponded to by the sympathy of those about him, were unable to effect his object.

Still the arts were kept alive by the monks of the early Greek and Latin churches, who, with pious diligence, illuminated manuscripts, and sometimes even decorated the walls of their chapels and convents with rude paintings. Some examples of this kind of art (miniature embellishments of books) are perhaps as old as the third century of our æra.

It has been usual to date the revival of art in Italy at about the tenth or eleventh century. The beginning of modern art may however be reckoned from an earlier time; rather, as Flaxman says, from the reign of Constantine, seven centuries earlier, when Christianity became the religion of the empire. Painting and sculpture then ceased to be employed, as heretofore, on the pagan gods, but were engaged to illustrate subjects connected with Christian worship. Even during the reigns of those emperors by whom the Christians were most persecuted, they ornamented their subterraneous retreats with sacred portraits and subjects from Scripture. (Flaxman's *Lectures on Sculpture.*) The artists to whom the chief merit of reviving art is due, are supposed to have derived no small benefit from the study of the remains of antient sculpture which were still scattered about Italy, and particularly in Pisa, the native city of the presumed founder of the first school of modern sculpture. Without denying this very probable effect of superior works upon minds just awakening to the beauties of art, it may be disputed whether its influence was so great as some have imagined. It scarcely can be traced where it might most reasonably be supposed to exist, namely, in any peculiarities or finer qualities of style or execution; and it surely must be conceded that the mind and spirit that are observable in the paintings and sculptures of the time of the revival are of an entirely original character and quite independent of the antient schools. This is remarkable in a class of design which at first seems peculiarly calculated to tempt modern artists to recur to the manner of the antients, namely, that in which symbols and allegorical figures are employed. In the examples that exist by one of the earliest painters, Giotto di Bondone (chiefly in the Capella 'dell' Annunziata' and in the 'Salone' at Padua), there certainly is no apparent imitation of any of the numerous and varied modes of treating such subjects that were offered to him in the monuments of antiquity. Without the most remote idea of underrating the excellence of fine antient models, it seems only just to assert a claim for the distinct and original character which divides modern Christian art from that of the Greek schools. A depth of thought, an intention pervades the Christian art, which shows an entirely altered feeling; and, after the first period of the rude and almost frightful attempts at design (usually in single figures, gaunt and staring images of the Apostles and saints), the revivers of art seem to have aimed at appealing to the sympathies, rather than gratifying the eye and pleasing the fancy only, by presenting to them beautiful forms. On this ground the artists of this age were essentially men of genius; for, instead of servilely copying, they drew from their own original sources; and the art that proceeded from them eventually became, as was the case with Greek art while master-spirits directed it, great and admirable.

Passing over the performances of the artists who were employed in different parts of Italy in the century before his appearance, Niccolo Pisano may be considered the father of modern sculpture. Many of the artists alluded to, united, as was usual in those days, the three professions of painting, sculpture, and architecture, and their works are interesting monuments of their ingenuity; but sculpture only assumed a distinct and appropriate character when the two Pisani, Niccolo and his son Giovanni, devoted themselves to it, and by their talents diffused a love of art throughout Italy. The cathedrals of Pisa, Pistoja, Siena, and Orvieto are rich in the productions of the Pisani. They consist of magnificent marble pulpits enriched with bassi-rilievi and statues, and are evidence of great power both in composition and in deep feeling. Among the more remarkable and beautiful of the works executed by Niccolo and his scholars are the rilievi which decorate the façade of the cathedral of Orvieto. They are in white marble, and the execution is careful, though it bears marks of want of practice in the mechanical requirements of the art. Their higher qualities compensate however for these minor defects. The subjects are illustrations of the Old and New Testaments; the Creation of Adam and Eve, the Temptation, the Expulsion from Paradise, &c. It is not easy to convey by description a just idea of the merits of these compositions. They are chiefly admirable for the simplicity of the arrangement of the groups, and for the grace and feeling which pervades some of the figures, particularly those of the angels. The draperies are also well understood, and are treated with considerable skill as regards the workmanship. Cicognara (*Storia della Scultura*) thinks that these are the productions of the scholars of Niccolo, and he denies that he executed any of them himself. One of the most masterly compositions of any school of sculpture is a work of Niccolo Pisano representing the 'Taking down from the Cross.' It is a semicircular basso-rilievo, in marble, and is placed over one of the side doors in the front of the Duomo of Lucca. Another remarkable work of Niccolo Pisano is a basso-rilievo representing the Last Judgment and Punishment of the Wicked, in the cathedral at Siena. The subject is not of that character in which the mind of Niccolo, judging from his other works, could satisfactorily be employed. His power seems to have been in treating gentle, delicate, or touching representations; but the performance alluded to has great merit for the boldness of the conception, the eager crowding or fearful shrinking of the figures, and for the masterly composition. The opportunity to introduce beautiful expression has not been lost: two figures of angels are particularly striking. Niccolo Pisano commenced his profession early in 1200. Some of his best works are at Bologna, where he was diligently employed in 1225. He lived to an advanced age, and was succeeded by his son Giovanni di Pisa, Arnolfo of Florence, and other scholars. Giovanni executed some esteemed works, but in natural genius he was inferior to his father, and he was satisfied rather to imitate what had been done, than desirous or able to advance the art. Sculpture did not make that progress after the death of Niccolo that might have been expected from the merit of his works and the fine opening he had made for its improvement. Arnolfo was much employed both as an architect and sculptor. Two of his works in the latter art, the monument of Boniface, and the Tabernacle in the church of St. Paul (fuore le mura), are preserved at Rome. The date of their execution is about A.D. 1300, or rather later. Among the more successful imitators of Niccolo Pisano may be noticed Margaritone d'Arezzo, Guido da Como, and 'Maestro' Buono.

In the year 1330, Andrea Pisano, the son of Ugolino, who was settled in Florence, executed one of the bronze gates of the Baptistery in that city. The sculpture illustrates the life of St. John. This work is admirable for its beautiful sentiment and simplicity, though it must be allowed to be defective in the mechanical excellences of sculpture. He also executed some statues in marble, but Flaxman thinks they are not equal to the productions of either Niccolo or Giovanni. Cicognara, in his 'Storia della Scultura,' gives a long list of the productions of this artist, and justly considers him entitled to the highest praise. Andrea Orcagna, contemporary with Andrea Pisano, was an architect, painter, sculptor, and poet. His works in sculpture, notwithstanding a certain dry quality of execution that pervades them, have great merit. His most esteemed performances are the sculptures on the altar in the chapel or oratory of Or San Michele in Florence. One of the compartments represents the Presentation in the Temple. In another are some heads, especially one of the Virgin, which are full of beauty. Orcagna showed great talent in the management of his draperies, preserving considerable breadth in the forms and disposition of the folds, and so composing them as not to conceal the action of the limbs. There are some curious monuments of this early period at Naples, where sculpture was practised by the followers and imitators of Niccolo and Giovanni Pisani. The Neapolitans pretend indeed to cite names of sculptors even earlier than the Pisani; and mention is made of 'Maestro' Fiorentino and Agnolo Cosentino of as early a date as the ninth and tenth centuries. Approaching however nearer to the time under consideration, we find the name of Pietro da Stefano mentioned as a respectable sculptor at Naples. His works are particularly commended for expression, a quality of difficult attainment in what may truly be considered the infancy of art. The two Masucci are also recorded among the sculptors who were at that time decorating Naples with their works. The chief occupation for the artists was in 'Deposits,' or tombs, monumental sculptures, and occasionally enrichments, in reliefs and small figures, on altars. The monuments were often of a very elaborate kind, uniting sculpture with architecture. Stories of figures in niches, or mixed up with Arabesque or Gothic ornaments, rose one above the other, till, at a certain elevation, the work took a pyramidal form, the apex of which was surmounted by a statue either of the Madonna and Child, or of a patron saint, or sometimes by an equestrian figure of the deceased. There are some very curious specimens of these compositions in many parts of Italy; one of the most remarkable is at Naples, in the church of S. Giovanni dei Carbonari.

The works of Luca della Robbia abound in Italy. They possess merit not only as works of art, but as specimens of a manufacture, or rather, a process, of which this sculptor is said to be the inventor and exclusive possessor. This was the art of covering *terra-cotta* models with a beautiful and peculiar coloured varnish, which renders them as hard as stone. He is supposed never to have disclosed this secret; but there is a tradition that he committed it to writing, and enclosed the paper, or whatever it was inscribed on, in some one of his models, before he sent it to be baked; so that it could only be known at the price of destroying, or at least injuring, a number of his works, till the document should appear. Among his productions are some of great beauty. They consist chiefly of groups, in alto-rilievo, of the Madonna and infant Saviour, or Christ and St. John as children, and similar subjects. Two works of Luca, bassi-rilievi in marble, formerly in the Duomo of Florence, according to Cicognara, but now preserved in the Gallery of Sculpture, deserve particular attention for their composition and the expression. They represent a choir, or groups, of singers. They are admirable for their truth to nature; and they only want a more elevated class of form to render them equal to the productions of the best works of the best periods of art. It is said that these rilievi were executed in competition with Donatello, whose rival performance is still in existence. Luca della Robbia died in 1442.

In the Gallery of Sculpture at Florence are preserved some extremely interesting specimens of art of this period, by Benedetto da Rovezzano and others. These works merit a careful examination, as they offer not merely valuable illustration of the progress that was being made in the art at the time they were executed, but they possess qualities which claim for them high praise as examples of rich composition and appropriate expression. Many of them are likewise worthy of attention for an approach to great beauty of form, and for the skilful treatment of the draperies.

The next distinguished names which occur in the annals of restored sculpture are those of Lorenzo Ghiberti and Donato di Betto Bardi, better known as Donatello. Ghiberti has secured a lasting reputation by his celebrated bronze gates of the Baptistery of Florence, the edifice on which so many preceding sculptors had been employed. The first gates mentioned by historians were executed by Buonano, in 1180: they were destroyed by fire. Andrea Pisano was the next artist employed upon them, and his and the later works at that edifice are fortunately still preserved. The contribution of Lorenzo is in a series of rilievi, ranged in compartments, illustrating subjects from the Old Testament. Michel Angelo is said to have admired them so highly, that he declared they were fit to be 'the gates of Paradise.' Lorenzo brought to this work a great knowledge of composition, a superior acquaintance with the more beautiful forms and movements of the human figure, a refined feeling for expression, and considerable powers of execution. They very far surpass the works of his predecessors in the revival of sculpture, and, in many respects, have not often been excelled. It is not pretended that these reliefs are free from faults. Their chief imperfection arises out of the undefined notions which then existed of the true principles that respectively govern, or should govern, composition in painting and sculpture. It is obviously out of the province of the latter art (which is confined to representing objects by defined forms alone) to attempt perspective appearances and effects which can only be truly and correctly given by aid of colour, or by the skilful distribution of light and shadow. In the work under consideration this principle is invaded. Objects are represented in various planes, and those which should be subordinate are, in consequence of the necessary relief given to them in order to define their forms, forced upon the attention, or cast shadows to the injury of more important features in the design. The number of small parts, and a too great minuteness of detail, are also defects in this remarkable work, and deprive it of that breadth of effect which is so admirable a quality in art. Ghiberti was less successful in a bronze statue of St. Matthew, on the exterior of the church of Or S. Michele. Flaxman observes of it, that 'it wants the severe chastity of the apostolic character; and the head is inferior to those in the spandells of his gates; the attitude also is affected, and the drapery unnatural.'

Donatello was a scholar of Lorenzo de' Bicci, and was born in Florence in the year 1383. The works of Donatello are numerous, and remarkable for their superior qualities. His conceptions were bold, and his execution vigorous, and it is easy to see in his performances the reason for the compliment paid to his statue of St. Mark by one who could so well appreciate these qualities as Michel Angelo: 'Marco, perchè non mi parli?' This, and a statue of St. George, also in marble, decorate the exterior of the church of Or San Michele at Florence. The St. George is a fine example of grand and simple expression. The figure, dressed in plate armour, stands firmly on both legs, and he rests his hands on his shield, which is held before him, its pointed base on the ground. There is a calm determination and a quiet dignity in this work. It is probable that the somewhat exaggerated treatment which is observable in this and other productions of Donatello, as well as of Ghiberti, arose from their desire to avoid the dryness and poverty of form in the works of some of their immediate predecessors. The gallery of sculpture in Florence contains some curious bassi-rilievi, in marble, by Donatello, representing groups of children dancing to music. The composition is most skilful, and the expression and character most carefully and successfully attended to. The relief is much more flattened than is usually seen in early works, and the background is studded with gold-leaf, laid on in small circles about as large as (and indeed much resembling) guineas or sovereigns: these probably are the rilievi which he made in competition with Luca della Robbia. Some bassi-rilievi by this sculptor exist at Padua; and making allowance for the age, they are very remarkable works. Donatello enjoyed a great reputation, and there is scarcely a city of any consequence in the north and middle of Italy that cannot boast some specimen of his talent. He introduced a mode of working reliefs that has not often been practised since his time. The sculptured portion is scarcely raised above the plane of the background. It has the appearance of the design having been drawn on the marble, and then engraved, as it were, under a strong side-light. This kind of work hardly comes legitimately under the name of sculpture, and can only be fitted for certain situations, in which, at a little distance, it has more the effect of a picture than of sculpture.

Brunelleschi, or, as he is called by the Italian historians, Filippo di ser Brunellesco, was contemporary with Donatello. He was an architect as well as a sculptor, and was the originator of the bold idea, which he so successfully carried out, of building the cupola of the Duomo of Florence. Vasari gives an interesting account of the difficulties this great artist had to contend with through the ignorance, the jealousy, or the want of confidence of those about him, when he first advanced this great project. Brunelleschi and Donatello, practising in the same city, were accustomed, it appears, to consult each other upon their works. The latter had carved in wood a crucifix for the church of Santa Croce at Florence, and the following anecdote of the two artists is related by Vasari:—Donatello, having finished his work, and being satisfied that he had produced a very admirable performance, invited his friend Brunelleschi to see it. Brunelleschi went, and, having had his expectations much raised by Donatello's own description and praise of it, could not conceal his disappointment, but gave evidence of it by the slight commendation he bestowed upon his friend's work. Upon being pressed to give his real opinion and sentiments, he said, 'that the figure placed upon the cross appeared that of a day-labourer, rather than a representation of Jesus Christ, whose person was of the greatest possible beauty, and who was in all respects the most perfect man that ever was born.' Donatello, already disappointed of the praise that he had anticipated, could not brook the unexpected severity of this remark: 'It is easier to criticise than to execute,' he retorted; 'do you take a piece of wood, and make a better crucifix.' Brunelleschi said no more; but upon his return home went to work, and after the labour of several months he finished a crucifix. This done, he invited Donatello one day, as if accidentally, to dine with him, and he having accepted the invitation, the two friends walked together towards the house of Brunelleschi, till they came to the old market-place, when the latter purchased various eatables, and giving them to Donatello, requested him to go on with them to the house, where he would join him presently. Donatello having reached the apartment of his friend upon the ground-floor, had his attention immediately arrested by the crucifix of Brunelleschi, which that artist had taken care to place in an advantageous light; and, standing before it, he became so absorbed in the contemplation of its extraordinary merits, as entirely to forget the provisions committed to his charge; for opening his hands which supported his apron, down came the eggs, cheese, and other things upon the floor. Notwithstanding which, he still continued in the attitude of one overcome with admiration, until the arrival of Brunelleschi, who, laughing, asked him how they were to dine now that he had spoiled everything. 'I,' answered Donatello, 'have had quite dinner enough for this day. You perhaps may dine with better appetite. To you, I confess, belongs the power of carving the figure of Christ; to me, that of representing day-labourers' ('A te è conceduto far dei Christi, à me dei contadini'). (Vasari, *Vite dei Pittori, &c.*; Ottley, *Italian School of Design;* Cicognara, &c.) These two works are still preserved. The crucifix of Donatello is in the church for which it was originally executed, and that of Brunelleschi is in the church of Santa Maria Novella. Though it is far from the perfection that the above anecdote would imply, it is a remarkable work for expression, and in that respect ranks deservedly before the performance of Donatello. It was evidently one of this artist's early performances, and this rivalry doubtless led him to pay greater attention to expression in his subsequent works. Those at Bologna and in other places are evidence of his application and success. Donatello died full of years and honour. He left a brother, Simon, who was invited to Rome by the pope, in 1431. While there he executed one of the bronze gates of St. Peter's. Giovanni di Pisa was another of the numerous scholars of Donatello. There is a large basso-rilievo in terra-cotta by this sculptor over the altar in a chapel of the great church of the Eremitani at Padua, which deserves notice for the simplicity and breadth of the composition, and for the peculiar manner in which it is executed. It is remarkable for the flat style of the relief—a mode of working that Donatello frequently adopted, and which, when judiciously managed, has a very broad and fine effect. The frieze of the Parthenon may be selected as a beautiful example of this style of executing basso-rilievo. The subject of the work alluded to at Padua is the Madonna and infant Christ, with three figures of saints on each side of them.

Italy was at this time filled with artists, many of them of distinguished merit, who found ample employment in what may be called church sculpture, and occasionally in executing statues of illustrious persons. Florence perhaps boasted the highest names in the several arts, but Bologna, Padua, Milan, Naples, Siena, Venice, Modena, and even the smaller cities of Italy, all had their schools of artists. The Majani and the two Pollajoli, Andrea Verrochio, Andrea Ferrucci, and Mino da Fiesole, are among those whose works claim attention among the best productions of the fifteenth century.

Andrea Verrochio is chiefly celebrated as having been the master of Lionardo da Vinci, and of Pietro Perugino, the master of Raffaello. It is said that Verrochio was at first a painter, but having desired Lionardo da Vinci, then a mere lad, to paint an angel in an altar-piece on which he was engaged, Verrochio found the performance of the scholar so superior to his own portion of the work, that in a fit of jealousy he resolved to paint no more, and he soon after devoted himself to the sister art. A bronze equestrian statue of Colleoni, by Andrea Verrochio, may be seen at Venice in the Piazza di S. S. Giovanni Paolo; it is interesting as a specimen of art of the time, but it is heavy in form, and the action of the horse is not true to nature. Verrochio provided the design and model for this group. It was cast in bronze by Alessandro Leopardo. Several of the works of Andrea are preserved at Florence.

It is a reproach to the artists of the fourteenth and fifteenth centuries, that, not satisfied with carrying out their own original ideas, and endeavouring to advance the practice of art within the limits of consistent design, they suddenly had recourse to the incongruous mixture of antient mythology with the existing religion, an unfortunate innovation which tended to check the steady progress of sculpture by engrafting a totally foreign class of design or taste upon their own original sentiment; they only misused and abused the one, and at the same time materially injured the effect of the other.

Michel Angelo Buonarotti was born in 1474. At an early age he became the scholar of Domenico Ghirlandajo, the most celebrated painter of his time, and afterwards studied under Bertoldo, the director of the academy established by Lorenzo de' Medici at Florence. The genius of M. Angelo was remarked by Lorenzo, who received him into his house, giving him apartments in the palace, and otherwise honouring him with marks of peculiar favour. As he increased in years, his wonderful powers as an artist were developed, and his powerful and vigorous genius placed him at once in the distinguished station which he still occupies. Till the time of Michel Angelo, the works of art since the revival were all more or less meagre and dry in style, although considerable feeling and talent were occasionally displayed in their conception (or invention) and composition. Extraordinary efforts were sometimes made, as by Ghiberti and Donatello, to infuse into them a better and more elegant quality of form, but it was left to Michel Angelo to effect that total revolution in style which has stamped not only his own productions, but the art of his age with a character peculiarly its own. The most striking quality in the works of Michel Angelo is an undefinable vastness and grandeur of effect that takes entire possession of the mind. This power is strongly felt in the presence of his Moses, in the monument of Pope Julius II., and of his statues of Lorenzo de' Medici (not 'il Magnifico') and Guiliano de' Medici, in their monuments in the family chapel at Florence. The Moses is a grand effort of genius. It is as original in conception as it is masterly in execution. The figure, of colossal dimensions, is represented seated. One hand rests upon the tables of the Commandments; the other crosses the front of the figure, and meets the ends of the beard, which falls in ample masses to the waist. The statue is draped, but the arms from the shoulders are naked, and, thus treated, contrast finely with the voluminous folds beneath, which, collected in the lap of the figure, fall in rich profusion on the ground. The turn of the head is remarkably striking; but the expression of the face is open to criticism, and the horns on the forehead, though they give a superhuman character, produce a disagreeable effect. The characteristic feature of this statue is its vast energy, but it is sufficiently tempered to preserve the repose which is essential to true dignity. This work requires to be studied with attention: its merits will then be found to compensate for those minor faults which at first sight offend the fastidious spectator, and which, it must be admitted, the manner of Michel Angelo threw more or less into most of the productions of his chisel and pencil. As a whole it illustrates the forcible expression applied to the general character of this artist's works, '*Di Michel Agnol' la terribile via.*' The statue of Lorenzo is also seated. He is represented absorbed in thought. He rests his face upon his hand, which partially covers the chin and mouth. The general action is one of perfect repose, and the expression that of deep meditation. It is impossible to look at this figure without being forcibly struck with the *mind* that pervades it. For deep and intense feeling it is one of the finest works in existence. It has been well observed of this statue, that it has no resemblance to the antique, but it rivals the best excellences of the antients in expression combined with repose and dignity.

In the lower part of the two monuments of Giuliano and Lorenzo, in the chapel of the Medici, are allegorical figures of Day and Night, and the Dawn, or Morning and Evening. They bear the impress of the master-mind and hand; but the violence of action and forced expression of these statues are not in character in the first place, with the repose which is appropriate to monumental sculpture, and they do not harmonise with the figures above them. The intimate knowledge of anatomy possessed by Michel Angelo, and the evident mastery he had over all difficulties of execution, appear sometimes to have tempted him, as in these statues, to indulge in their display at the expense of propriety of design.

In the Minerva church at Rome is a much admired statue of Christ by M. Angelo. It has less of violence action than usually characterises his works; but though has qualities of a high order, and displays great knowledge of form and skill in execution, it is by no means one of his most successful efforts. The figure wants that calm dignity and refinement which should pervade the representation of the divine nature under a human form. Another work of Michel Angelo, which is often referred to as a specimen of this master, is the statue of David, in the Piazza del Gran Duca at Florence. The powerful hand of the great sculptor is visible in it, and the grand air that is given to the figure by the turn and expression of the head and throat justly claim our admiration; but it is not one of Michel Angelo's finest works. It was executed under very unfavourable circumstances, Buonarotti having been called upon to finish it when the block had already been worked upon by an inferior artist, and considered to be spoiled. In the gallery of Florence is a half-drunken Bacchus, also the work of this sculptor. An antient subject, it still has the merit of being filled with Michel Angelo's own feeling for character and expression, but it falls short of the manner in which the Greeks would have treated it. It wants purity of taste, and the beautiful form, free from affectation or display, which the antients knew so well how to apply in all their conceptions. Michel Angelo in this work attempted to represent what he could not feel as a Greek sculptor would, and to this only is to be attributed its inferiority. Among the best-known groups by Michel Angelo are the Madonna and Child, in the chapel of the Medici at Florence—unfinished; a Pietà, in a small chapel at St. Peter's at Rome; and a group of Nicodemus supporting the dead body of Christ, with the Madonna and Mary Magdalen. These, as compositions, are of the highest merit. They also abound in pathos, and are in many respects finely executed. The Dead Christ, in the Pietà, is particularly worthy of attention. The tranquillity and perfect repose of death are most successfully shown throughout this figure, and with some slight exception (in the face and in the articulations of the joints, in which the usual exaggeration of Michel Angelo is perceptible), it must be considered one of his finest productions. His works in relief are not very numerous. We possess in this country one in marble, of very great merit, consisting of three figures, representing the Virgin, the Infant Christ, and St. John. It is unfinished, but the master is declared in the composition of the group, in the grand style of the forms, and in the bold and vigorous character of the execution. It is in the Royal Academy of Arts, having been bequeathed to that institution by the late Sir George Beaumont, who purchased it in Italy. There is another work very similar to this, and like this also unfinished, in the Gallery of Sculpture at Florence. In the Vatican is another of a different class. It is an allegorical subject, and is a monument of the perfect knowledge of the human figure possessed by Michel Angelo; but it is more remarkable for this than for other qualities requisite in sculpture, namely, simplicity and unity of design. The composition is both crowded and complicated. In taking this rapid survey of some of the principal works of this master, the object has been to bring before the reader the most celebrated of his productions, in order that the accompanying observations might be immediately applied to well-known examples, and the characteristics of his school be more easily understood. Notwithstanding our admiration of the originality of invention, the vigour and mental energy, the knowledge of anatomy, and mastery of execution that appear in his productions in this art, it is generally admitted that the sculpture of Michel Angelo does not give that high satisfaction which is felt in the contemplation of the best works of antient and some even of modern times.

Michel Angelo has had many imitators who have had neither genius nor originality to compensate for the imperfections which are overlooked or forgotten in the mighty inventions of the master-mind, and who for the most part have only been able to copy and increase the faults of his style. Michel Angelo died in 1564, and was buried in the church of Santa Croce in Florence, and a monument is over his grave, in which there is a basso-rilievo, by himself, of a Madonna and Child. The design of this 'deposito' consists of a bust of Michel Angelo over a sarcophagus, in front, and on each of which are statues supposed to represent Painting, Sculpture, and Architecture. The bust and the statue of Sculpture are the work of Lorenzi, one of his scholars; those of Painting and Architecture are by Valerio Cioli and Giovanni dell' Opera. In the 'Dictionnaire des Beaux Arts,' Lorenzi is made the scholar of Bandinelli.

There is a group, in marble, in the Chigi Chapel, in the church of Santa Maria del Popolo at Rome, representing Jonas with the sea-monster, which is remarkable for the grand style of its composition, as well as for the breadth and beauty of its forms. It is attributed to a sculptor who lived in the sixteenth century, called Lorenzetto, but there is a tradition that the design was furnished by Raffaello, and that he even made the model from which the sculptor executed the marble figure. Michel Angelo had a very high opinion of the works of Beggarelli, a sculptor of Modena, and is said to have exclaimed, on being shown some of his models, 'If this clay could but become marble, woe (*guai*) to the antique.'

Jacopo Tatti, better known as Sansovino, is more deserving of celebrity as an architect than as a sculptor. His chief productions, in both arts, are at Venice. Some statues on the Scala dei Giganti (the Staircase of the Giants), at the Palace of the Doge at Venice, and some bassi-rilievi in other places, especially a bronze gate at St. Mark's, are examples of his ignorance of or indifference to the true principles of design in sculpture, though it would be unjust to refuse them the merit of much elaborate execution. Many of his scholars became distinguished artists. Among them may be mentioned Nicolo Tribolo, Danese Cattaneo, some of whose works are in the church of S. Antony in Padua, Bartolomeo Ammanati, Alessandro Vittoria, a sculptor of great merit, and probably Tommaso Lombardo. About this time a profusion of ornament began to be associated with works in sculpture, and led artists to neglect the simpler qualities of design for high finish and minutiæ of mouldings, flowers, scrolls, and other objects of minor importance. Among the ornamented works of the *cinque cento* which are most worthy of notice, are the splendid altar candelabra in some of the Italian churches. There are some particularly fine specimens of this kind of work at Venice. Baccio Bandinelli, born in 1487, is among the distinguished contemporaries of Michel Angelo, Sansovino, and the great sculptors of that time. He appears, from some anecdotes related of him by Vasari, to have been extremely unpopular with his brother artists, and his works were criticised with unsparing severity; but, although some exaggeration in design and defects in execution may be visible in them, they possess qualities which claim for their author a distinguished place among modern sculptors. There are some bassi-rilievi in marble, by Bandinelli, round the screen of the high altar in the Duomo of Florence, which are admirable for their breadth and the fine treatment and disposition of their draperies. The fault of his composition generally, whether of one or several figures, is in its too picturesque arrangement, and in his placing his figures in somewhat forced and affected attitudes. He made a portrait of himself in a group in marble, the size of life, of Nicodemus supporting Christ. It is in the church of the Annunziata at Florence, and was intended for his own monument. In the Palazzo Vecchio is a group, or rather two single statues, of Adam and Eve, with the tree and serpent between them; this is inferior, in all respects, to the former work. The restoration of the right arm of the celebrated group of the Laocoon was entrusted to Bandinelli. Some critics believe this arm should be turned back, and that the hand or some part of the serpent should touch the head of the figure. [Laocoon.] In Bandinelli's restoration the arm is extended.

There is a work of considerable merit, and also of some interest from the circumstances under which it was executed, in the church of S. Petronio at Bologna. It represents the story of Joseph and the wife of Potiphar, and is the production of Propertia de' Rossi, a lady of great personal beauty, and highly accomplished in various branches of the fine arts. It is said she became enamoured of a young artist who did not return her love, and the disappointment threw her into a languishing disorder which terminated in her death. Her last work was the basso-rilievo above mentioned. In it she represented herself as the wife of Potiphar, and the object of her affection as Joseph escaping from her. She died, in the flower of her age, in the year 1530.

Benvenuto Cellini, born in Florence, in 1500, was one of the most distinguished sculptors, founders, and chasers in Italy. All his larger works are in bronze, and are preserved in his native city; but numerous specimens of his skill in smaller productions, as medals of gold and silver, bucklers, dagger hilts, and tasteful ornaments, are in foreign collections and afford ample evidence of the superior talents of their author. The particulars of his life and the history of many of his works are graphically told by himself, in one of the most entertaining autobiographies extant. [Cellini, Benvenuto.]

The list of sculptors of this school, or rather of this division of time (for each effected changes that tended to interrupt the existence or continuance of schools), must close with Guglielmo della Porta, the most skilful of all the artists of Lombardy. He was the scholar of Pierino del Vaga. He was also a favourite of Michel Angelo, from whom he received a very high compliment. Guglielmo had been employed to restore the legs of the famous Hercules (now called the Farnese) of Glycon, which he did so admirably, that when, after a time, the original legs were found, Michel Angelo was unwilling to remove Della Porta's for those which had so unexpectedly been recovered. Della Porta executed few works. The most remarkable, as an example of the influence of the style both of Michel Angelo and of Raffaello, is the monument of Paul III., in St. Peter's at Rome. Two recumbent statues in this work, one a female of advanced years, representing Prudence, and the other, a young and beautiful woman, as Justice, are particularly fine. The latter figure is deficient in the expression and character proper to the subject, but it is a remarkable performance for the roundness and richness of its execution, and for the knowledge of form displayed in it. This statue was originally naked; since Della Porta's time it has been partially covered with bronze drapery. This artist effected some changes in the process of casting in bronze. [Bronze.]

At the end of the sixteenth and the beginning of the seventeenth centuries the sculptors aimed chiefly at fine and curious execution. The works of that time exhibit very high merit in many respects, but they are deficient in repose and simplicity. Instead of grace, we find affectation, and mechanical skill was held in higher estimation than what may not improperly be called the moral qualities of art. The works of Giovanni di Bologna, a native of Flanders, but established in Italy, offer ample illustration of this meretricious and destructive taste in sculpture. They are full of imagination, and are executed with a boldness and ability that both surprise us and call forth our admiration, but there is at the same time an exaggeration in the attitudes and an endeavour after picturesque effect that disappoint us. Baldinucci, in his 'Life of Giovanni di Bologna,' records the following anecdote:—At the early part of his career as an artist he showed Michel Angelo a figure, which he had finished with extreme care. 'Young man,' said Michel Angelo, after looking at the work, 'learn to compose your figure before you endeavour to finish it.' One of the most remarkable performances of this artist is his well-known group, in marble, of the Rape of the Sabines. As a specimen of invention it is wonderful for its expression and its energy of action; and it is impossible not to admire the courage of the sculptor who ventured to execute so daring a work in such a material; but it is open to criticism for the extravagant corkscrew contortions of the composition. His famous bronze statue of Mercury is conceived in the true spirit of poetry, and is deservedly admired as one of the most elegant productions of modern art. The form is light, and the action graceful. He had many imitators, who, like copiers in general, chiefly exaggerated his faults. There are few works of Stefano Maderno, but there is a simplicity of composition and a beauty in the sentiment of his statue of St. Cecilia that justly claim for him a place among the most worthy of the sculptors of this age. This statue was executed when he was very young. The supposed body of St. Cecilia was found in Rome, in 1599, during the pontificate of Clement VIII., and Stefano Maderno was employed to make a careful copy of it before it was removed to where it now lies, in the church of the convent dedicated to this saint in Rome. This may account in a great measure for the superiority of this work over others by the same artist. Limited by the circumstances, and by the pontiff's command to take nature as his model, he had no opportunity to introduce any of the prevailing bad taste. The result is a work of great beauty, one of the best of that age, and in certain qualities not surpassed by later artists.

Bernini was born at Naples, in the year 1598, and exhibited at a very early age his predilection for the art in which he afterwards became so celebrated. It is pretended that a marble head was executed by him at ten years of age. Bernini possessed genius, imagination, ambition to excel, unceasing industry, and great powers of execution; and still, with all these means and dispositions, he was, beyond all others, instrumental in precipitating the decline of sculpture, and the tendency, already exhibited, to prefer minute execution to the higher qualities of design was confirmed by the popularity it acquired in the hands of this artist.

It would be difficult to conceive two styles more opposed to each other than that adopted by the sculptors of this age and that of the great artists of antiquity. In one the pervading principle was simplicity and expression, united with beautiful and appropriate form. In the other, simplicity was of all things most studiously avoided; and complicated arrangement in composition, forced action in the figures, flying draperies, elaborate carving and undercutting (in works of marble), and other means of little more than mere mechanical display, were resorted to, in order to create surprise or to please the eye. Under Bernini all the distinctive bounds of the classes of art were trampled down. Sculptors endeavoured to imitate the effects of the pencil, and architects to introduce into their compositions the curved line of beauty.

The faults and merits of Bernini as a sculptor will be best shown by a reference to and criticism of a few of his best-known works. His group of Apollo and Daphne in the Villa Borghese, is a production of great merit for its invention and power of telling its story. The god has just reached the object of his pursuit, and, at the moment when he seizes her, Daphne's prayer is heard, and the beautiful form is being metamorphosed into a tree. Instead of generalising this part of the history, Bernini appears to have delighted in the opportunity of showing his skill in execution. The hair and drapery of Apollo are floating in the air, while the change that is to preserve Daphne from violence is shown in detail, in her tresses, the toes and fingers becoming elongated into roots and branches, the latter terminating in carefully-worked laurel-leaves. St. Peter's at Rome contains various works of this artist. The most remarkable of these are the splendid monuments of Urban VIII. and Alexander VII., which may be said to exhibit all his excellencies and all his defects. The former stands opposite a celebrated work of Guglielmo della Porta before mentioned (the monument of Pope Paul III.), and is a melancholy proof of the consequences of losing sight of purer principles. Della Porta's was not a school of perfection; but the contrast between the grandeur of manner of his time and the handicraft display of Bernini's period is distressing. The composition of the second work alluded to, the monument of Alexander VII., is as strange as the execution is wonderful. The sitting figure of the pope occupies the centre of a large and deep niche. The whole of the lower part or ground is filled up with curtain and cloud, in the corners of which are plunged four allegorical groups of figures. Of those at the back of the recess but little can be seen except the heads and shoulders. In the front corners are Truth and Charity, the latter a gigantic female with fleshy infants pressed against her breast, to whose weight the marble appears to yield with all the elasticity of a soft pulpy substance. This work is a triumph of execution, but debased by the worst taste. A group of the Ecstasy of St. Teresa in the church Della Vittoria at Rome is another instance of the want of simplicity. In this it is difficult, amidst the flutter of the drapery and the ample convolution of clouds, to discover either the figure of the saint or the subject of the composition. Of the single statues of Bernini, that of David preparing to throw the stone has merit for the earnestness and energy of the expression. The figure is a portrait of the artist, who was very young when he executed this work. His statue of St. Bibiana is also considered one of his best productions; but compared with the St. Cecilia of Stefano Maderno (and the comparison is strictly just, as both represent draped female figures, of the same character, lying on the ground), it is an inferior work. The Four Doctors of the Church supporting the Chair of St. Peter, in the church of that apostle at Rome, is a grand idea; but its effect in execution is injured by the want of simple unaffected expression and attitudes. These statues are colossal. They are cast in bronze, and some parts of the figures and draperies are richly gilt. This composition, taking it altogether, has a magnificent effect. Fontana calculated, from the archives kept in Rome, that this work must have cost a hundred and seven thousand crowns. The sum expended on the whole edifice, up to his time, was forty-six millions eight hundred thousand and ninety-eight crowns; and Cicognara thinks he does not exaggerate when he calculates that a tenth of this was spent on works executed under the direction of Bernini. The fountain in the Piazza Navona at Rome is one of the strange and daring performances of this artist. Cicognara observes of Bernini, that he was architect, mechanist, sculptor, and founder. He was more than this. In proof of the versatility of his talents, mention is made of a theatrical entertainment given by him in Rome; for which he built the theatre, painted the scenes, cast the statues, constructed the engines, wrote the comedy, and composed the music. Bernini lived during nine pontificates; from that of Clement VIII. to Innocent XI. No artist ever had greater patronage, and few greater talents, which, unfortunately for sculpture, were ill-directed, or at least ill-disciplined; the variety of his pursuits and his inordinate love of picturesque effect ruined the progress of the art, induced a false taste in patrons and artists, and, from the injury effected by his bad example, it may safely be said that it would have been better for sculpture if Bernini had never lived.

Alessandro Algardi, a native of Bologna, was contemporary with Bernini, and executed many works of merit. Like other sculptors of the time, he was tempted away from the more valuable qualities that should characterise sculpture, by the endeavour to gain distinction by the display of execution and the picturesque effect of his compositions. The great work of Algardi is his alto-rilievo, preserved in St. Peter's, of the discomfiture of Attila by the miraculous appearance of St. Peter and St. Paul. This work is in marble, in five pieces, and measures about thirty feet in height by nearly eighteen in width. Algardi studied the paintings of his contemporaries for the manner of treating his subject; and the consequence is such as might be expected in an art in which it is totally impossible to produce those effects of distance, clouds, and perspective which only can be given by colour. There are merits in parts of this great composition, which increase the regret that is felt at the faults that are so apparent in other portions of it. In the unpleasing task of following the traces of this decay, it is refreshing occasionally to find examples of a purer taste. Francesco di Quesnoy, better known from his title of Il Flammingo, was a native of Brussels. His early works are said to partake very much of the character of those of Bernini and Algardi; but it is recorded that he was led to copy and study very young children (*putti*), from admiring the beauty of those introduced into his pictures by Titian, and he ultimately became the first sculptor in this class of representation. There are few, whether they have travelled or not, who have not had an opportunity of admiring some specimens of this artist's skill in the round, healthy, playful character of his infants. No artist, except perhaps Raffaello, ever succeeded so entirely in portraying the peculiar charm of beautiful childhood. He preserved just the right medium between tameness and exaggeration. In the church of La Madonna di Loreto at Rome there is a work by Flammingo, which represents St. Susanna, and it may fairly be considered one of the most successful efforts in sculpture of the age. The expression of the head is especially worthy of attention. It has simplicity and intenseness combined with considerable beauty of form. Francesco Mocchi obtained a high reputation in his time. The work by which his merits may best be judged of is in the Duomo of Orvieto. It represents the Annunciation, in two distinct figures. The angel is supposed to be descending, and is supported on a cloud; while the Virgin, in an attitude of shrinking modest fear, is bowing her head as she receives his announcement. Its faults are the faults of the age,—a want of simplicity and too much of the picturesque in effect. The figures are life-size, and executed in marble. The forms are rather heavy, and want that refined character appropriate to a subject of this kind. As examples of elaborate execution, further illustrating the decay of pure taste and the fall of sculpture, the works of San Martino and Corradino may be noticed. Some statues by these artists are preserved at Naples, in the church of S. Severo. One represents the dead body of our Saviour, covered with drapery, under which may be traced all the forms of the figure: a piece of ingenuity of no very difficult attainment, but which always surprises and delights those who are ignorant of the mechanical processes of sculpture, and who think that whatever has the *appearance* of being difficult in art must be so, and measure out their admiration according to their estimate of the ingenuity with which it is overcome. The other is a figure of Modesty, veiled. There is also a third statue, of Deceit, within a net,—a very curious piece of execution. These works attest the patience of their respective authors, and are monuments of their bad taste.

The works of the contemporary and immediately succeeding sculptors do no more than prove the rapid consummation of the fall of sculpture. Occasionally an artist of better taste or higher feeling appeared; but he was not seconded or supported by any refined feeling in patrons, nor inciting sympathy in the public; and the enumeration of works by the Rusconi, Bonazzi, Tagliapietra, Torretti, Morlaiter, Foggini, and others, would assist but little in conveying any distinct impression of the slight shades of difference in the generally fallen and decayed practice of the art.

In the general survey of the rise, progress, and decline of sculpture in modern Italy, may be seen, very nearly, the history and condition of the art in other European countries. The artists of Italy spread themselves over the Continent, and wherever works of design were required, they probably were called upon to execute them. The influence of the taste of the schools of Lionardo da Vinci, Primaticcio, Benvenuto Cellini, Rustici, and others, will be visible in the works of their different times, in France and other countries; and even when it can be ascertained that sculpture was produced by native artists, it generally will be found that their knowledge of art was due to Italian models or Italian masters.

The French historians attribute to native artists the tomb of Philip le Hardi, which was executed in 1404, as well as that of Francis II. The first sculptor who really was distinguished in that country was Goujon. He executed various important works in the sixteenth century. Amongst the most distinguished sculptors of succeeding times may be honourably mentioned Pilon, Anguier, Puget, Girardon, Le Poutre, Le Moine, and Coustou; but sculpture soon became decorative in France, and flutter in composition and design, and minuteness in execution, characterised their art almost from the sixteenth century to a very recent period. The extreme of the worst style of French sculpture is seen in the monument of Marshal Saxe by Pigal, which was erected about the year 1775.

The earliest sculptors of Spain who are mentioned by their historians of art are Aparicio and Rodolfo, who lived about the year 1033. The next is Jayme or Jacques Castyls of Barcelona, who is said to have executed various statues in the façade of a church at Taragona in the year 1376. The name of Anrique occurs in 1380, and of F. Gonzalez in 1399. It seems however that no great progress was made in the arts in this country till the sixteenth century, when Spanish artists went to Italy to study, or Italian artists established themselves in Spain.

The history of sculpture in Germany would lead us into a wide field of inquiry. It is not necessary towards illustrating the general history of the progress of the art, which may be traced with sufficient accuracy through the different Italian schools; and the examination of the causes of its rise and the changes of style it has undergone amongst the Germans would carry us into speculation, or at best into its merely national or local history, rather than assist us in giving a general and comprehensive view of the art. Läffler, or Löffler, is said to have executed the bronze statues which stand round the tomb of the emperor Maximilian at Inspruck; he died in 1565. Others attribute them to two brothers of the name of Godi, who lived at the beginning of that century. The latter name suggests the probability that artists from Italy were then established in Germany, or were called upon to execute works of this description.

The political disorders in which Italy was involved in the earlier part of the eighteenth century, may account in some measure for the inactivity in which the arts remained for some years. The wars of the Succession in the kingdom of Naples, the change of dynasty in Florence in the year 1737, and the unsettled state of other parts of the country, diverted men's minds from such pursuits. Cicognara attributes much also to the debased or degraded state of feeling among his countrymen. He says, 'The Italians were too much inclined to love their state of slavery and their ease; to prefer the pleasures they could procure from other countries, and foreign frivolities;' and he exclaims, 'Dove è spento ogni amore, ogni odio, che vita aver' possono le arti che solamente son mosse dalla fantasia e dal cuore.' (*Storia della Scultura,* vol. iii., p. 209.) This condemnation is more general and severe than appears to be warranted by facts, and it certainly seems unjust to attribute to the moral degradation of Italians of the eighteenth century the decline of art which had commenced so long before. It is admitted that, prior to this time, taste in art had greatly deteriorated. The effect of the state of feeling described as existing in this later time was to leave sculpture in its fallen state, when a little energy might possibly have restored it. From 1748 to 1796 Italy enjoyed an uninterrupted course of peace; and it is true that during that period there scarcely was a work in sculpture of any magnitude or comparative excellence produced.

The first sovereign who contributed to revive the arts from this state of torpor was Charles III. of Naples. He encouraged architecture on a grand and extensive scale. At Rome, Cardinal Albani formed a collection of the finest remains of antient sculpture that could be procured; and by attaching to him all the most distinguished litterati and the best artists of his day, made his palace the resort of all who felt an interest in the pursuits to which he himself was so devoted. Under the auspices of this 'Hadrian of his age,' as Cardinal Albani has been justly called, Winckelman produced the first work in which the history of the arts of design had been treated in a learned, philosophical, and scholarlike manner; and it has been the model and groundwork of all succeeding and improved works upon the same subject. The popes Clement XII. and Benedict XIV., as well as Clement XIII. and Clement XIV., contributed also to create a feeling for the sculpture of the antients by accumulating monuments of various kinds in the pontifical palace. To Clement XIV. we are indebted for the foundation of the Museo Clementino in the Vatican; which received such noble additions by the liberality of his successor Pius VI., that the name of the latter pontiff was associated with that of its founder in giving a title to the collection; and a considerable portion of the gallery of antient sculpture is still known as the Museo Pio Clementino. Till Pius VI. issued an order to prevent the removal of works of art, the remains of antiquity discovered in Rome and its neighbourhood could be sold and taken out of the country. The pope, desiring to increase his collection, and preserve to Rome whatever could be recovered by excavation, prohibited anything being removed out of his dominions without a special permission. This order procured for his agents the first choice of whatever statues or other monuments of sculpture were found; and the extensive purchases effected by this means soon filled the Vatican with works of antient sculpture, which, with the additions made by succeeding popes, have made it the most celebrated as it is the most valuable collection of its kind in the world. The discovery of the long buried remains of art in Herculaneum and Pompeii led to the formation of a museum of the same kind at Portici; and in bronzes especially, the Neapolitan collection is without a rival. Among the sovereigns of Italy who contributed to the revival of design, Leopold, grand-duke of Tuscany, must likewise be included. The sculptors of this period were Cavaceppi, Penna, and a few others, in whose hands sculpture made some progress towards a more healthy state. The immediate influence of the Bernini school had ceased to be felt, and the opportunity was given, which these artists in some degree availed themselves of, to introduce art upon purer principles. It must be admitted that what they produced was eminently deficient in original feeling; and their best works were little more than somewhat tame copies or adaptations of antient subjects and models; but at least the practice of the art was continued, and when men of greater power and more vigorous minds appeared, they had not to begin afresh from the infancy of sculpture, nor from the miserably low point to which the Bernini manner had reduced it. Before touching upon the most celebrated sculptors who reformed and restored the taste for art in our age, we shall take a rapid survey of the history of sculpture in England.

The Britons had not the advantage of very skilful instructors in the Roman soldiers by whom the country was so long held in subjection, but during this foreign dominion the native inhabitants had learned to adopt many of the arts. The making of arms and coining money had also taught them some important processes in the more refined arts, and the knowledge thus acquired was not allowed to fall into entire disuse; and it appears that after the departure of the Romans the Britons continued to practise some branches of sculpture. Speed (quoted by Flaxman, *Lect.* I.) says that 'king Cadwallo, being buried in St. Martin's church, near Ludgate, his image, great and terrible, triumphantly riding on horseback, artificially cast in brass, was placed on the western gate of the city,' &c. The workmanship of this 'great and terrible' statue was doubtless very rude and barbarous, but it is interesting to find the tradition of a work of art cast in brass in this country at so early a date. The death of Cadwallo is placed at A.D 67[illegible]

The edifices erected in England after the final settlement of the Saxons in this country, and down to the reign of Henry I., seem to have been nearly in the same style, exhibiting plain fortress-like construction, and repetitions of heavy columns and arches. Sculpture was so little employed, that it is believed there is no sepulchral statue in England of earlier date than towards the end of the eleventh century, though the French had begun to decorate their coffin-lids with figures, &c. as early as the ninth. We must conclude therefore that this practice was first introduced into the country at the Norman invasion.

All the oldest monuments in which figures are thus represented are of ecclesiastics. Two specimens of these sculptured effigies, carved in very low relief on coffin-shaped slabs, may be seen in the cloisters of Westminster Abbey. They are supposed to represent two abbots, Vitalis, who died in [illegible], and Crispinus, who died in 1117. Similar monuments are preserved in Worcester cathedral, of St. Oswald and Bishop Wulstan. These sculptures, of extremely rude design and workmanship, have been much injured by time and violence, but they are curious as the earliest examples of the kind in this country. It has been thought probable that one reason for not decorating with figures, or any distinguishing device, the stone coffins in which more illustrious persons were enclosed, was to preserve them from the chance of violence which might have been offered to them in order to gain possession of the ornaments that usually were deposited with individuals of exalted rank. Several monuments of bishops and abbots which have been opened have shown the deceased fully habited in his episcopal robes, with his ring on his hand, and an enriched crozier either lying by his side or across the body. The more sacred character of the occupant of the tomb, and of the objects buried with him, might prevent any indignity being offered to them; but kings and princes would not be considered in the same view, and, as they would no doubt be even more richly dressed than ecclesiastics, however high their rank, their tombs would offer greater temptation to sacrilegious avarice. The circumstance of the tomb of William Rufus in Winchester cathedral being entirely devoid of ornament may be thus accounted for. That of Gundred, daughter of William the Conqueror, at St. John's church, Southover, is inscribed, and embellished with foliage, heads, and other decorations, but there is no figure of the deceased on it.

When the Crusaders returned from the Holy Land, they endeavoured to introduce into England a taste for the magnificence they had witnessed in foreign countries, and imitations were attempted of the rich foliage and other decorations employed in their architecture. In the west door of Rochester cathedral are some figures so applied.

We believe the earliest specimen in England of figures in armour is of the time of Richard I. Those in the Temple church, of Magnaville or Mandeville, earl of Essex, and of two other knights similarly habited, are probably of this date.

The first example that occurs in England of a monumental figure in royal costume is that of king John, on his tomb in Worcester cathedral. An interesting proof that the figures carved on the lids of tombs were tolerably accurate representations of the persons whose remains they contained was afforded by the opening of the coffin of king John in the year 1797. The body, &c. was in a state of sufficient preservation to show that it had been dressed in precisely the same costume as that represented in the sculptured effigy.

Wells cathedral was built by Bishop Joceline, who died in 1242. The west front of this church is richly studded with sculpture, consisting of representations, in relief, of Scripture subjects, and of statues, many of them of colossal dimensions, of kings, queens, saints, bishops, and other patrons or dignitaries of the church. This work must have been in progress at the time that Niccolo Pisano, the restorer of sculpture in Italy, was exercising his art in his own country. Flaxman (*Lectures on Sculpture*) thinks that the greater part of the sculpture was by English artists. S of the statues exhibit much grace and simplicity, and, allowing for the very rude state of art at the time they were produced, they deserve the attention of the curious. The sculpture of the succeeding reign was probably by Italian artists, scholars or imitators of Niccolo Pisano, and who travelled about in search of employment in those countries where ecclesiastical buildings were being erected. The richly decorated Crosses that were raised to distinguish the spots wherein the body of Queen Eleanor rested, were probably by these artists, as well as the statues of Edward I. and Eleanor in Westminster Abbey. The flat brasses with figures sculptured, or rather engraved on them, and let into stone slabs, are mostly of the fourteenth century, few being met with earlier than the reign of Edward II.

Under Edward III. it appears that our own countrymen were capable of exercising some branches of the arts of design. Many specimens of that date remain to prove both the extent to which sculpture was employed, and the merit of the artists by whom the several works were executed. Some interesting examples of art of the fourteenth century may be seen in three recumbent statues in memory of the sons of Edward III.: one is of the Black Prince, in Canterbury cathedral; another of Prince William of Windsor, in Westminster Abbey; and the third of Prince William of Hatfield, in York Minster. These works were executed between the years 1344 and 1378. There are also three remarkable windows of this date at Dorchester church near Oxford: one of them is adorned with between twenty and thirty small statues relating to the genealogy of our Saviour; the others contain reliefs representing Scripture subjects. Various other equally interesting works, exhibiting the progress of the art, belong to this date; and the names of several English artists employed by Edward III. at Westminster are recorded. (*History of Westminster Palace*, by Smith; Flaxman, &c.) The figure, in plate armour, of Beauchamp, earl of Warwick, on his tomb in the Warwick chapel, with the numerous smaller statues let into niches around it, are the work of William Austin, an English sculptor and founder. It was executed in 1439.

The chapel of Henry VII. in Westminster Abbey is one of the most beautiful specimens of rich architectural decoration that exists in this or perhaps any country. The statues within and without it are said to have amounted originally to 3000, but the number is probably exaggerated. An Italian artist, Torreggiano, assisted in the construction of this magnificent tomb; but there is strong reason to believe he was employed on the tomb only, and that the greater portion of the sculptures in other parts of the chapel were executed before he arrived in the country, and it is presumed they were the productions of native artists. Some of these statues show a beautiful feeling for art, and are well worthy of attention for the simplicity and grace of their action, and for the tasteful arrangement and careful execution of the draperies.

From the reign of Henry VIII. to Charles I. sculpture fell into neglect. Indeed it frequently happened that, during the religious animosities and the party violence that prevailed, works of art, and more especially works of sculpture, were purposely destroyed. Charles I. showed a strong disposition to encourage the arts. The celebrated Cartoons of Raphael were purchased by order of the king, and, with other fine works, were brought into this country. In this reign we meet with the names of English sculptors. Christmas executed a monument to Sir William Pitt and his lady, at Strathfieldsay in Hampshire; and Stone is the author of a monument in Westminster Abbey, in memory of Sir George Holles, which is not without merit. Generally speaking however, the style and composition of these and other works of the time are utterly worthless, but there is some boldness occasionally in the conception, which may claim for them a passing notice. The sculpture on the pedestal of the Monument of London representing Charles II., attended by allegorical groups, raising the City of London (under the form of a prostrate female figure), is a striking example of the pseudo-classical and false taste, in art, of the seventeenth century. After this time, the principal works in England were by foreigners; and the names that most frequently occur are Cibber, Steevens, De Vere, Bertoeini, Scheemacker, and Roubiliac, as the authors of monuments and whatever other productions that were required in sculpture. This variety of artists, as Flaxman observes, from different countries,—French, Flemings, and Italians,—sometimes brought the taste of John Goujon or Puget, sometimes a debased imitation of John di Bologna and the Florentine school, and sometimes the taste of Bernini, but never a pure and sound principle. In 1766 an English sculptor, Nathaniel Read, executed a monument, which may be seen in Westminster Abbey, in memory of Admiral Tyrrell. It would not be easy to convey by description any just idea of the strange conceits and incongruous imagery that abound in this work; and without the aid of the inscription it would be impossible to comprehend the purpose and subject of the artist's ingenious, and, it may truly be said, costly labours. Admiral Tyrrell died at sea, and his body was committed to the deep. In the lower part of the composition are three allegorical figures, life-size; one of them represents Ireland, as the admiral, we are told, was descended from an antient family of that country, and above is the apotheosis of the deceased. The 'Historical Description of Westminster Abbey,' after giving the explanatory inscription, notices the work in the following words: 'On a piece of rock—"The sea shall give up her dead, and every one shall be rewarded according to his works." The figures of History, Navigation, and Hibernia are well cut; they are represented among the rocks, with the sea above their heads, the admiral himself ascending amidst heavy clouds.' This fully describes the style of the art during the greater part of the eighteenth century. Allegorical pictures were executed in stone and marble, and it was absolutely necessary to have explanations attached to the work in order to enable the spectator to comprehend the meaning of the sculpture. The monuments contain every variety of a most confined idea; and Time, Fame, and Death, represented in the most absurd, and often most objectionable forms, are made the accompanying illustration to almost every work on which the sculptor was employed. The works of Roubiliac, with all their defects, have merits which redeem them from this general and deserved condemnation [Roubiliac]; but, with the qualified exception in his favour, the productions of the artists who practised with him, and after his death, can only be classed in the lowest grade of art; it is impossible to imagine anything more false and poor than the style that prevailed.

Early in the present century, the first step was taken towards forming in England a national collection of antient works of art. The Townley Marbles were purchased by a grant of parliament, and placed in the British Museum in the year 1808. Since this period the collection has been enriched by the addition of the Athenian (or Elgin) Marbles, the Phigalian Marbles, various fine bronzes, and other valuable specimens of antient sculpture.

The honour of giving a new direction to taste, or rather, of leading it back to a recognition of true principles, is eminently due to Flaxman and Canova. 'To Canova Italy owes her emancipation from those false perceptions which had, from the influence of the Bernini school, so long diverted the current of pure taste. . . . . To Flaxman the art owes equal obligation. Banks had corrected the grosser impurities, and had stemmed the torrent of bad taste.' 'No modern sculptor has entered so deeply into the recesses of antient art as Flaxman; his style was founded upon their principles, combined with the simplicity of the Pisani and others of the fourteenth century.' The above short extracts from the address of Sir R. Westmacott, who succeeded Flaxman as professor of sculpture in the Royal Academy, place the merits of these two distinguished artists—the restorers of sculpture—in their true light. In the Theseus of Canova, one of his best and earliest works, we recognise the long-lost purity of form and a decided devotion to the simplicity of the antique. In the designs of Flaxman simplicity, grace, and expression resume their influence, in place of the affectation and display of fanciful ingenuity that had so long prevailed. The later works of Canova show a tendency in that great artist to a more minute execution and attention to small parts than is quite consistent with the best taste in sculpture; and it may be objected to Flaxman, that, in his admiration of the beautiful and impressive in design, he too often neglected the means of making his works effective in execution; but it is not expedient to enter here into a critical examination of their respective merits and defects. Their works, the best evidence of the superiority of these distinguished sculptors, are before the world, and a comparison of their productions with those of the entire series of artists from the time of Michel Angelo (and the best of his immediate followers) down to our own age, will at once exhibit their merit in its true point of view—in the influence they have had in restoring a degraded and fallen art to its proper position.

Mechanical Process of Sculpture.—The technical or mechanical processes of sculpture are for the most part extremely simple. The sculptor, having conceived or invented his subject, usually begins by making a slight sketch of it, either drawing it on paper, or at once modelling it, in small, in clay or wax. This preliminary step enables him to judge of the arrangement, and to correct and improve the general composition of his figure or group. He next proceeds to build up his statue of the desired size. The first thing necessary is to construct a sort of *nucleus*, or skeleton, by which the clay may be supported. This is made of wood or iron, according to the strength required, and the limbs are usually made movoable, by attaching the skeleton parts to the main support, or trunk, by wire joints. The figure is then built up in clay; and whether it is ultimately to be draped or not, it should always be modelled naked, in order that the true forms may be easily distinguished, and the drapery made to fall naturally. In modelling in *relief*, a plane, or ground as it is called, is prepared, upon which the sculptor carefully draws his design. The clay is then laid and pressed upon this, the outline of the figures being bounded by the lines of the drawing. The projection or fullness of the forms must of course depend upon the fancy of the artist, or the purpose or situation for which the work may be intended. The same rule with respect to modelling the figures naked should be observed here as in figures or groups in the 'round.' To preserve the models from shrinking and cracking, it is necessary to sprinkle the clay occasionally with water; and on leaving them, to cover them over with damp cloths.

The next process is 'casting.' The model being completed, a mixture is made of plaster of Paris and water, which is thrown over the whole. When this is 'set,' or hardened, the clay within it is picked out, and there remains an exact mould of the model. This is washed, and the interior is brushed over with any greasy substance, usually a composition of oil and soap, to prevent the fresh plaster, with which it is next to be filled, from adhering too firmly to it. After the mould is thoroughly filled in all its parts with this plaster, mixed to about the consistency of cream, the latter is left to set. The mould is then 'knocked off' with chisels, and a 'cast' of the model is produced entire. If it is intended to execute the work in bronze, the same general principle is observed in the moulding; but there are particular processes to be attended to, in order to enable the mould to bear the weight of the metal, and to ensure the soundness of the 'cast.' [Bronze.]

In copying a model in marble, the first step is to prepare two stones of the same size, or at least with an exactly corresponding graduated scale marked on the front of each, on which the block of marble and the model are respectively to be placed. The fronts of the two scales are so constructed or fitted up, that a 'pointing' instrument can be applied to them. This instrument is usually composed of a pole or standard, to which a long brass or steel 'needle,'—capable of being extended and withdrawn, loosened or fixed, and moved in every direction by means of ball-and-socket joints,—is attached. This is made to touch a particular part of the model. The whole instrument is then removed to the scale-stone on which the rough block is placed, and the marble is cut away till the needle reaches as far into the block as it had been fixed at upon the model. A pencil mark is then made upon the two corresponding parts of the model and block, and thus what is technically called 'a point' is taken. This process is repeated till the numerous points at fixed depths, corresponding throughout with the surface of the model, are attained, and a rough copy of the sculptor's original work is thus mechanically made. These instruments for pointing marble statues are not always constructed in precisely the same manner. The practice of different sculptors has suggested various changes in detail, by which either the movement of the whole machine from one scale-stone to the other is facilitated, or a greater rapidity and security in taking points is attained; but the principle on which they act seems to be exactly similar in all. The statue being rudely blocked out or pointed, the marble is in this state put into the hands of a superior workman called a carver, who copies the minuter portions of the work, by means of chisels of various sizes, rasps, and files; the pencil marks or points showing him the limits beyond which he is not to penetrate into the marble. When the carver has carried the work as far as the sculptor desires, he proceeds himself to give it the finishing strokes, by retouching and improving the details of form and expression, producing varieties of texture and surface, and by giving that general quality or appearance to the whole which constitutes what is termed harmony of effect.

SCURF is a material composed of minute portions of the dry external scales of the cuticle. These are, in moderate quantity, continually separated by the friction to which the surface of the body is subject, and are in due proportion replaced by others deposited on the inner surface of the cuticle. Sometimes however they separate in unnatural quantities, and this constitutes the disease called Pityriasis. [Pityriasis.]

SCURVY. This word, as well as its Latin synonym *scorbutus*, has been used very vaguely, both by medical men and by the public at large, to designate various diseases of the skin, often differing essentially from each other. Its derivatives, *scorbutic* and *antiscorbutic*, of which the former is employed to designate a supposed virus, the source of these diseases, and the latter the remedies employed for their cure, have been misapplied in a similar manner.

Scurvy, properly so called, is a malady of a peculiar nature, which occurs either at sea or on land as the result of various moral and physical causes of disease, especially of deficient nutriment and a scarcity or total deprivation of succulent vegetables or fruits. Its origin is involved in obscurity, and it is a question still debated whether it was known to the Greeks and Romans. Of its prevalence in the middle ages we have abundant testimony, but the frequent famines that resulted from the imperfect state of agriculture at that day gave rise to so many diseases which, though different, yet had many points of resemblance, that we run considerable hazard of confounding them. Thus there is a great similarity between scurvy, the disease which was then called St. Anthony's fire, ergotism (the peculiar disease produced by spurred rye or other grain), and some of the pestilential fevers of the middle ages, both in their causes and symptoms, that there can be no doubt that the chroniclers of those times often mistook one for the other. It is customary to fix upon the year 1260 as the date of the first authentic mention of the malady, which then appeared in the Christian army during the campaign of St. Louis in Egypt. In the north of Europe however it would seem that scurvy has been known from the most remote antiquity, and until within the last two centuries it prevailed there endemically. With the improvements in gardening and agriculture, it gradually became less frequent, and land-scurvy is now nearly extinct in Europe. As late as the middle of the last century it was common not only among the peasants on the borders of the Baltic, but it prevailed in Scotland and in some of the sea-port towns of Devonshire and Cornwall, breaking out in winter, and disappearing as vegetable food became more abundant with the return of spring. Even down to the present day the disease has occurred in camps, as in the French army of the Alps at the close of the last century; and in besieged towns whose inhabitants have been deprived of fresh vegetables. A famous French physician, M. Fodere, mentions that isolated cases occur every year in the most unhealthy quarters of Paris. Some of its earlier symptoms may occasionally be observed in patients admitted into the London hospitals; and our Prison Reports prove it to be by no means uncommon in persons sentenced to long periods of confinement. Diseases are still endemic in various parts of Europe, which present a great analogy to scurvy both in their causes and symptoms; such as the Radesyge in Norway, the Mal de la Rosa in the province of Asturias in Spain, and the Pellagra in Lombardy.

But though frequent upon land, it is at sea that the ravages of scurvy have been most severely felt, and any one at all familiar with the accounts of our early navigators must remember many heart-rending tales of suffering which they record. Even as recently as the time of Lord Anson scurvy was so fatal that during the first two years of the voyage he lost more than four-fifths of his original crew. The sagacity of Captain Cook however, only thirty years afterwards, suggested to him such means for the preservation of the health of his ship's company, that in a voyage of more than three years only one sailor of the Resolution died. The improvements which, at the suggestion principally of the late Sir G. Blane, were introduced into the victualling of the navy at the end of the last century, and especially the free employment of lemon-juice, have banished this disease from our navy, though it is still by no means infrequent in the merchant service.

The causes and treatment of Scurvy are described under ANTISCORBUTICS. The reader may also consult with advantage, 'A Treatise of the Scurvy,' by James Lind, M.D., Edinburgh, 1753, and Dr. Budd's 'Treatise on Scurvy,' in vol. v. of the 'Library of Practical Medicine.' The following remarks may be considered as an addition to what was said some years ago on the causes of scurvy, in the article ANTISCORBUTICS.

The use of salt provisions has been very generally regarded as one of the most powerful exciting causes of scurvy. This notion however is not altogether free from error, for scurvy occurs even among those who never taste salted food. Such was the case with some of our troops quartered in the province of Adelaide at the Cape of Good Hope, among whom scurvy appeared in the year 1836. The men at that time had no hard duty to perform, and were supplied with fresh meat in abundance, but were deprived of vegetables. The annual occurrence of scurvy among the inmates of the lunatic asylum at Moorshedabad in India is an additional confirmation of the same fact. We may with more propriety refer the disease to the absence of vegetables than to any directly injurious effects produced by salt provisions.

The greatest attention to ventilation was not found during Lord Anson's voyage to diminish the severity of the disease; and this circumstance, coupled with other facts, such as the non-occurrence of scurvy in the ill-ventilated houses of the poor in London, warrants the conclusion that impure air is not an exciting cause of scurvy.

Some facts have led to the supposition that cold and moisture tend much to produce scurvy, but Dr. Budd, in his able treatise on scurvy, in the 'Library of Practical Medicine,' states that the men admitted with scurvy into the Dreadnought hospital-ship come almost exclusively from the Mauritius, India, Ceylon, or China. The non-existence of scurvy at Venice, and in other similar situations, proves that moisture alone cannot produce the disease.

It has been asserted, but never satisfactorily proved, that scurvy is propagated by contagion; an opinion which is now usually regarded as erroneous.

From all investigations, we may conclude that there is one condition which never fails to produce scurvy in persons, however various their situations may be in other respects, namely, a prolonged abstinence from succulent vegetables or fruits or their preserved juices as an article of food. But we are hardly warranted in asserting, as some men of eminence have done, that a deficiency of vegetable food is the only cause capable of producing scurvy. A disease very similar to scurvy, which used to attack the negroes in the West Indies, was attributed to their living exclusively upon bananas, and its cure consisted in changing their diet, and giving them fish and flesh to eat. Bad nutriment, of whatever kind, will, according to M. Foderé, sometimes produce the disease, and Dr. Henderson, a naval surgeon, recently stated in a medical periodical, that he has seen scurvy occur in persons who were taking daily doses of lemon-juice as a prophylactic against the disease.

Previous debility appears to predispose to scurvy, as does also an advanced age; the disease being rarest between twenty and thirty years of age, though it occurs more frequently between the fifteenth and twentieth year than in the succeeding ten years. The first symptoms of the affection are a change of the natural healthy complexion to a pale or sallow tint, accompanied with pains in the legs and loins, great languor and despondency, and indisposition to exercise. The gums soon become sore, apt to bleed on the slightest touch, livid and spongy. As the disease progresses the debility becomes greater, the slightest exertion inducing breathlessness and palpitation, and the complexion assumes a brownish or dingy hue. The gums become more livid, and swell more, so as sometimes to conceal the teeth, which drop out without undergoing decay. Hæmorrhage takes place from the lungs and from various internal organs, ecchymoses appear, and blood is effused under the skin in various parts, especially on the lower extremities and around the seat of any old injury. In the ham this effusion of blood is sometimes so considerable as to cause contraction of the knee-joint. Any wounds or ulcers put on an unhealthy appearance, and become covered with coagulated blood, and the slightest scratches degenerate into troublesome sores. In high degrees of scurvy, as in the case of Lord Anson's sailors, old wounds break out afresh, and a broken bone will become disunited, although the fracture may have been consolidated for some time. With these symptoms there is not so much derangement of the general functions as might be expected. The appetite usually continues good, though the patients are unable, owing to the state of their gums, to masticate their ordinary food; they sleep well, and the intellect is unaffected, though the spirits are much depressed. Scorbutic persons swoon readily, and not unfrequently die suddenly on making some more considerable exertion than usual.

If the disease should prove fatal, discoloured spots are found in many internal organs, while their tissue generally is of a paler colour than natural. The blood contains a less quantity of red particles than usual, but they are not dissolved in the serum, as some have supposed.

SCUTAGE. [ESCUAGE.]

SCU'TARI (*Skodré*, in Albanian, and *Iskanderé*, in Turkish), a considerable town of Northern Albania, and the capital of a pachalik which is considered one of the most important in European Turkey, is situated at the southern extremity of the lake Zenta or of Scutari, where the Boyana issues from it, and about eighteen miles from the coast of the Adriatic. It is a fortified town, and has two castles. The population of Scutari is reckoned at about 16,000, more than one-half of whom are Christians, chiefly of the Greek church, and have a bishop. There is also a Roman Catholic bishop for those of that communion. Scutari has manufactures of arms and of woollens; the fishery on the lake constitutes another branch of industry. The lake is about sixteen miles in length from north-west to south-east, and from three to five miles in breadth, and it contains several small islands. The lake lies in the high land of Albania, and is surrounded by offsets of the chain of the Scardus, and borders, on the north, on the territory of Montenero.

SCU'TARI, a town on the Asiatic shore of the Bosporus, facing Constantinople, of which it may be considered as a suburb. It is built on the slope of a hill, and has several fine mosques and magnificent burying-grounds planted with cypresses. Many of the wealthier Turks of Constantinople choose to be buried at Scutari, from an old tradition that their race will one day be driven out of Europe. There are also fine country-houses and kiosks in the neighbourhood. The late sultan Mahmood built handsome barracks at Scutari for his regular troops. One of the best views of Constantinople is from the hill just above Scutari. The population of Scutari is reckoned by Malte-Brun at 35,000 inhabitants. The place is one of considerable traffic, being the great thoroughfare between the capital and the Asiatic provinces of the empire.

SCUTIBRANCHIA'TA, M. de Blainville's name for his third order of *Paracephalophora Hermaphrodita*, consisting of the families *Otidea* [HALIOTIDÆ and ANCYLUS], and the *Calyptracea* (*Crepidula* and *Calyptræa* [CALYPTRÆIDÆ]), *Capulus*, and *Hipponyx* [PILEOPSIS], and *Notrema*.

SCYLAX of Caryanda, a town of Caria near Halicarnassus, a mathematician and musician, was the author of a 'Periplus of the parts beyond the Columns of Hercules,' of the 'History of Heraclides, king of the Mylasseis,' of a 'Periodos of the Earth,' and an 'Answer (ἀντιγραφή) to the History of Polybius.' (Suid., Σκύλαξ.) If all these works are rightly assigned to the same person, Scylax was at least not earlier than the age of Polybius. But it seems probable that there were two writers of the name.

Herodotus (iv. 44) says that Darius, the son of Hystaspes, wishing to know where the Indus entered the sea, sent various persons in whom he had confidence, and among them Scylax of Caryanda, to make the discovery. They set out from the city Caspatyrus and the territory Pactuica, and sailed down the river to the east and the rising of the sun. On reaching the sea they sailed westward, and in the thirtieth month arrived at the place whence the Phœnicians had set out who were sent by the king of Egypt to circumnavigate Libya. To this Scylax some writers attribute the extant work entitled Περίπλους τῆς Οἰκουμένης, or the 'Periplus of the Inhabited World,' which contains valuable information on the settlements of the Carthaginians, on the towns and colonies of the Greeks, and other matters. Consequently

Scylax must have lived about 500 B.C. Other critics assign the authorship of the extant Periplus to the middle of the fourth century B.C. Dodwell considers the author of this 'Periplus' to be a contemporary of Polybius, and consequently he would belong to the second century B.C. The 'Periplus' was first published by Hoeschel, with other minor Greek geographers, Augsburg, 1600, 8vo. It is also comprised in the first volume of the 'Geographi Græci Minores' of Hudson (and in the first volume of the same work, edited by Gail, Paris, 1826, 8vo.), which contains the Dissertation of Dodwell. This dissertation, and that of Sainte-Croix, in the 42nd vol. of the 'Recueil de l'Académie des Inscriptions,' appear to exhaust the subject of Scylax the geographer.

SCYLITZES. [BYZANTINE HISTORIANS.]

SCYLLA'RIANS, a tribe of *Macrurous Decapods*, established by M. Milne Edwards on the genus *Scyllarus* of Fabricius, and forming one of the most remarkable groups, distinguished at the first glance by the singular conformation of the external antennæ.

Carapace very wide and but little elevated, its anterior border nearly straight, and presenting a horizontal prolongation which advances between the base of the external antennæ and covers the insertion of the first pair. The eyes are lodged in well-formed orbits, and are somewhat distant from the median line. The *antennæ* are inserted on the same line below the eyes; the first pair are slender, and present nothing remarkable; their first joint is nearly cylindrical and much stouter than the two following ones; finally, they terminate by two very short multi-articulate filaments. The external antennæ are foliaceous and extremely wide; the piece which carries the auditory tubercle is confounded with the epistome, and followed by four joints, the second and fourth of which are lamellar and extremely large. The buccal frame is small, and the jaw-feet are moderate and nearly pediform.

Jaw-foot of Scyllarus.

The *sternal plastron* is very wide, and composed of a single piece. The first four pairs of feet are terminated by a styliform tarsus, and so are the posterior feet in the male, but in the female they terminate in an incomplete pincer. The abdomen is very wide, and terminates by a great fan-shaped fin composed in the ordinary manner, but with its foliations soft and flexible for the three posterior fourths of their length. The first abdominal ring is without appendages, but the four succeeding segments carry each a pair of false feet, the form of which varies according to the sexes. In the male the first pair are large, and have two foliaceous laminæ; but the succeeding pairs have only one, the size of which diminishes rapidly, so as to become rudimentary on the fifth ring. In the female all these appendages are much more developed, and serve to suspend the eggs. The *branchiæ* are composed of brush-like filaments, and are arranged in tufts, between which the great flabelliform plates belonging to the thoracic feet raise themselves. There are twenty-one branchiæ on each side, two above the second pair of jaw-feet, three above the external jaw-feet, three above the anterior feet, four above each of the three succeeding feet, and one above the posterior foot.

M. Milne Edwards divides the tribe into three genera, *Scyllarus, Thenus*, and *Ibacus*.

Scyllarus. (Fabr.)

The *Scyllari*, properly so called, differ, observes M. Edwards, from the other crustaceans of the same tribe, in the general form of their body, which is much more elongated than that of the others, and diminishes but very little in width towards the tail. The carapace is much longer than it is wide. The lateral borders are parallel. The *orbits* are situated very far away from the median line, very near the external angle of the carapace, but not reaching it; they are circular, and directed upwards. The *sternum* is of moderate size, and narrows but little or not at all between the posterior feet. The generative apertures of the male are circular and of moderate size. The *abdomen* is very thick, and longer than the whole of the anterior portion of the body, the antennæ included.

M. Edwards divides the genus into two sections:—

1.

Species the rostriform prolongation of whose carapace is very wide, but slightly projecting, and terminating anteriorly by a straight border.

Example, *Scyllarus arctus.*

Description.—Brown with transverse red lines on the abdomen. Length about three inches.

Locality.—The Mediterranean.

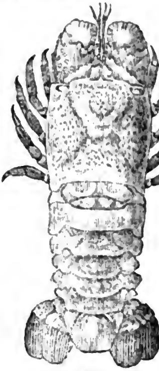
2.

Species the rostral prolongation of whose carapace projects very much, is nearly square, and terminated forwards by one or two more or less marked horns.

Example, *Scyllarus Æquinoxialis.*

Description.—Yellowish mingled with red. Length about a foot.

Locality.—The Antilles.

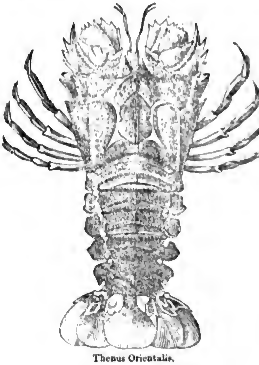


Scyllarus Æquinoxialis.

Thenus (*Scyllarus*, Fabr.; *Thenus ?*, Leach).

Body very much depressed, and much narrowed from before backwards. Ocular peduncles very long. Eyes going beyond the carapace laterally; the orbits, directed outwards, occupy the external angle. Sternum much wider than in *Scyllarus*. Abdomen with nearly the same proportional length as in those crustaceans.

Example, *Thenus Orientalis.* Length about eight inches.



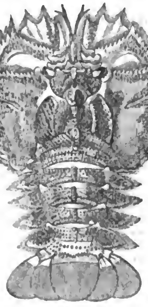
Thenus Orientalis.

Ibacus. (Leach.)

Carapace much wider than it is long, and with a lamellar prolongation on each side, which covers the greater portion of the feet, nearly as in CALAPPA, the *Cryptopods* [ŒTHRA], &c., among the *Brachyurous Decapods*. These prolongations are greater forwards than backwards, whence it results that the carapace is narrowed posteriorly. Thus in these animals there is a wide and deep fissure, which, on each side, divides these shield-like prolongations into two unequal portions. The orbits, instead of being placed near the external angle of the carapace, are very far distant from it. The abdomen is very short, and is suddenly narrowed from before backwards.

Carapace of Ibacus, seen from above.

Example, *Ibacus Peronii*. Length about five inches
Locality.—The seas of Australasia.



Ibacus Peronii.

FOSSIL SCYLLARIANS.

Under the name of *Scyllarus Mantelli*, M. Desmarest, in his 'Histoire Naturelle des Crustacés Fossiles,' describes a fossil crustacean, the antennæ of which are unknown, but which presents in the organization of the carapace and the base of the feet a striking resemblance to the living *Scyllarians*.

SCY'LLARUS. [SCYLLARIANS.]

SCYLLIS and DIPŒNUS. [SCULPTURE, p. 126.]

SCYMNUS of Chios, who was alive about 80 B.C., wrote a description of the earth (περιήγησις) in Greek iambic verse, which he dedicated to Nicomedes, king of Bithynia, probably the third of the name. The first 741 verses are extant, and fragments of 236 other verses. His description begins at Gades, and follows the left coast of the Mediterranean as far as the entrance of the Pontus Euxinus, where the last verse ends. Among the remaining verses there are about 90 on the coast of Asia. The work has no value as a poem, and very little as a geographical description. Still it contains some curious facts. It was first printed by Hoeschel with Scylax in 1600, but under the name of Marcianus of Heraclea. It is also comprised in the second volume of Hudson's 'Geographi Græci Minores,' and in the edition of that work by J. F. Gail, vol. ii., 1828, 8vo.

SCY'TALE (Zoology), Merrem's name for a genus of *Boïdæ* (*Pseudoboa*, Schn.), which has plates not only on the muzzle, but on the cranium, like the colubers; no fossets, the body round, and the head all of a piece with the trunk, as in *Tortrix*. N.B. The *Scytale* of Daudin is the genus *Echis* of Merrem.

SCY'TALE (σκυτάλη, a stick) is the name of a secret mode of writing which was used by the ephors at Sparta in their communications with their kings or generals when abroad. The ephors cut the material upon which they intended to write into one long stripe, like a narrow riband, which they wound about a round staff so as to cover the whole. The command or communication which they had to send was then written upon it, and then the slip of writing-material was taken from the staff and sent to the king or general. The slip appeared only covered with single letters, which none could read unless he wound the slip around a staff of precisely the same size as that used by the ephors. Kings and generals therefore, when they went abroad, were provided by the ephors with a staff precisely like that which the ephors themselves intended to use in their communications with them. (Plut., *Lysand.*, 19; *Schol. ad Thucyd.*, i. 131; Suidas, *s. v.*) This rude mode of sending a message must have originated at a very early period, but no instance of it is recorded previous to the time of Pausanias. (Corn. Nepos, *Paus.*, 3.) After the Peloponnesian war, we find the Spartans using the scytale also as a medium through which they sent commands to their allied cities. (Xenoph., *Hist. Gr.*, v. 2, 37.)

SCYTHE. The common scythe is an instrument too well known to require a minute description, but as much of its utility in agriculture depends on a correct adjustment of its parts, we shall briefly advert to them. The blade of the scythe, which is always curved, with the cutting edge on the concave side, is fixed to the handle at an angle both to the plane of the blade and to the tangent to the curve. It is on the nice adjustment of these angles that the perfection of the instrument depends. A scythe must cut the corn or grass, especially the latter, as near to the ground as possible, and where the land lies flat and the stones have been removed from the surface, a good scythe, in the hands of a skilful mower, will cut the grass so near to the ground that little or no stubble is left. Every farmer knows well that an inch of the grass near the ground adds more to the weight of the hay than several inches higher up, and that a skilful mower with a good scythe can easily add much more to the value of the crop than his earnings amount to, however liberally he may be paid, and that it is of the greatest importance that none but the best mowers be entrusted with the work, and that attention be paid to the form of their scythes and to their being frequently whetted.

It is the custom in England for the mowers to stoop much in mowing, by which they imagine that they have a wider sweep. The angle at which the handle is fixed is very acute to the plane of the blade. In other countries the mowers stand more upright, and a longer handle gives them a greater radius. Habit makes that position easier to which we have been long accustomed; but it is probable that a man can endure fatigue, and continue his exertion the longer, the more nearly his position is erect. In some countries the handle of the scythe is nearly straight, and the end of it passes over the upper part of the left arm. The position of the mower is then nearly erect, and his body turns as on a pivot, carrying the blade of the scythe parallel to the ground, and cutting a portion of a considerable circle. The position of the handle in this case must be such that when the scythe is in the middle of its swing, and the blade parallel to the ground, it rests naturally on the left arm above the elbow, while the mower is nearly in an erect position. By turning his body to the right, and stooping towards that side, he begins his cut, and by raising himself up, the muscles of his back greatly assist in swinging the scythe round.

The blades of the scythes on the Continent are mostly made of natural steel, such as is found in parts of Germany, and they are so soft that the edge can be hammered to sharpen it and keep it thin. In England the scythes are forged thin and well tempered, and to prevent their bending they have a rim of iron along the back to within a few inches of the point. This saves much time in sharpening, and they very seldom require the grindstone.

Most scythes have two projecting handles fixed to the principal handle, by which they are held, and these are variously put on, according to the fashion of the district. The real line of the handle is that which passes through both the hands and ends at the head of the blade. This may be a straight line or a crooked one, generally the latter, and by moving these handles up or down the main handle, each mower can place them so as best suits the natural size and position of his body. Hence it is that a man can seldom mow well with another man's scythe.

In mowing corn when ripe which is an economical mode of reaping, the scythe need not have so great a sweep; nor is it necessary to cut the straw so near to the ground. The great difficulty here is to lay the cut corn evenly, so that the binders can readily collect it and tie it into sheaves. This is most effectually done by adding to the bottom of the handle a small hoop at right angles to the line of cutting, and by mowing always towards the standing corn, which is easily done by beginning at one end and going round toward the left in an irregular spiral to the centre of the field. The straw is thus laid leaning against the standing corn, and is readily collected with the arm by the binder, who follows the mower. As the straw is not always upright, but frequently bent to a side, this mode of mowing is not always practicable. When the corn is only slightly bent down, a scythe with an addition of a cradle, as it is called, collects the slanting straw more easily. The cradle is a species of comb with three or four long teeth parallel to the back of the blade, and fixed in the handle. This inserts itself behind the straw to be cut, raises it up, and, by a peculiar twist of the scythe after the stroke, it is left so as to be easily collected. Those who are accustomed to use the cradle-scythe do the work rapidly and well.

When the corn is much laid and entangled, it is impossible to use the common scythe, even with a cradle. This has probably suggested a scythe to be used with one hand, while a hook in the other gathers the straggling corn. The most perfect of these scythes is called the *Hainault scythe*, from a province of that name in Belgium, where it was first noticed. It is commonly used in different parts of the Continent. The Hainault scythe is swung by the power of the wrist principally. It does not cut the straw by so oblique a stroke as the common scythe, but rather as a bill-hook or axe would do, meeting the straw nearly at right angles. The hook collects a small bundle, which is severed at a stroke, and the left foot assists in holding what is cut and rolled together with the hook, in the hollow of the blade. It is thus laid aside, and fit to be tied up. This instrument is a great improvement on the English fagging-hook, which is used in the same manner, the left arm of the reaper acting the part of the hook; but as the handle is inserted in the plane of the blade, it causes the reaper to stoop low, which is fatiguing to the loins, especially of elderly people, who can more readily reap with the Hainault scythe.

The scythe is an instrument which should be more generally introduced in harvest, and experience has proved that it had many advantages over the sickle or reaping-hook. [HARVEST.]

SCYTHIA, SCYTHIANS. (Σκυθική, Σκύθαι.) The name of Scythians is sometimes applied by the antient writers to all the nomade nations in the north of Europe and Asia; but this use of the word is not general, and it is more correctly confined to certain distinct nations.

The term Scythia was originally given to a part of Europe, and was for a long time restricted to that country. Thus Scythia was, according to Herodotus (iv. 101), a square, of which each side measured 4000 stadia, one side being 2000 stadia from the Ister to the Borysthenes, and 2000 from the Borysthenes to the Palus Mæotis, both measurements being along the coast; and another side being 4000 stadia, measured from the sea (the Pontus) to the Melanchlæni. There is considerable difficulty in determining the boundaries of the Scythia of Herodotus; but it may be said in general terms to have comprised the south-eastern part of Europe, between the Carpathian Mountains and the Tanais or Don. Different accounts are given of the origin of these Scythians; but the statement which Herodotus (iv. 11) considered the most probable, ascribed to them an Asiatic origin. According to this account they were driven from their settlements to the north of the Araxes by the Massagetæ, and after crossing that river descended into Europe, and drove out the Cimmerians from the country, which was afterwards called Scythia. The date of their migration into Europe may be determined with tolerable accuracy, if the irruption of the Cimmerians into Lydia in the reign of Ardys (about B.C. 640) was the immediate consequence of their defeat by the Scythians. (Herod., i. 15.)

The Scythians seem to have been a Mongolian people, from the description which Hippocrates gives of their appearance, and Herodotus of their customs and habits. Hippocrates (p. 292) speaks of their gross and bloated bodies, their joints buried in fat, their swollen bellies, and their scanty growth of hair. They were divided, as the Mongols have always been, into various hordes, which wer all in the time of Herodotus dependent on the horde of the Royal Scythians, who dwelt above the Palus M (Herod., iv. 20.) The general and genuine name of Scythians is said to have been Scoloti; the name of Scyth or Scythians was given to them by the Greeks. (Herod., iv. 6.)

The only two important events in the history of Scy mentioned by Herodotus are, 1st, the invasion of Med the Scythians in the reign of Cyaxares (B.C. 635-595), their conquest of Asia as far as the confines of Egypt, wh they held for 28 years; and, 2ndly, the invasion of Scy by Darius, the son of Hystaspes, in which the Persians we unsuccessful.

In subsequent times the Scythians lost all their po The Getæ conquered a great part of the west of their c try, and the Sauromatæ pressed upon them from the ea the latter people eventually obtained possession of the greater part of Scythia, and gave their name to the w country. [SARMATIA.] In the time of Pliny (*Hist. Nat.*, 25) the Scythians had become extinct as a people: t place was occupied by the Germans and Sarmatians, the Scythian name was confined to the most remote unknown tribes to the north.

The name of Scythia began to be applied to the north parts of Asia in the Macedonian period. Herodotus tinctly separates from Scythia all nations east of Tanais, such as the Thyssagetæ, Issedones, &c.; and fixed use of the word still subsisted at the time of Al ander's conquest of Asia. But when the Macedon found on the Jaxartes nations resembling the Scyth they gave the name of Scythia to this part of Asia thus an Asiatic Scythia was supposed lying to the eas the true one. This is the Scythia proper of Strabo, as antient Scythia had in his time become Sarmatia.

In the time of Ptolemy the name of Scythia was give the country between Asiatic Sarmatia and Serica: it w bounded on the south by India. Its limits to the nor were undefined. It was divided into two parts by Imaus (*Altai* and *Chaltai*), a range of mountains wh runs in a north-easterly direction from the Himal The western part was called Scythia intra Imaum, and eastern Scythia extra Imaum.

(Niebuhr's *Researches into the History of the Scyth Getæ, and Sarmatians*, published in his *Kleine Schrifte* and translated, Oxford, 1830; Heeren's *Researches*, & 'Asiatic Nations,' vol. ii.; Rennell's *Geography of Herod*

SCYTHROPS, Dr. Latham's name for a genus of b allied to the Toucans. [RAMPHASTIDÆ, vol. xix., p. The general structure accords with that of *Pteroglossus* there are no serrations on the margins of the mandi The wings are long, the two first quills are graduated, the third is the longest. The long tail is graduated.

Locality.—Australia. (White's *Voyage*.)

SEA is a term by which the whole volume of wat designated, which occupies the lower portion of the sur of our globe, and thus separates the more elevated larger masses which are called land, and which rise ab the level of the sea. The proportion of the solid surface our globe to that which is covered with water, is about o three, so that three-fourths of the entire superficies of globe are sea.

Sea-water has a salt and somewhat bitter taste, and it natural state is unfit for drinking or for culinary purp It has been ascertained that the specific gravity of s water is about 1·0277, rain-water being 1·0000. The w of closed seas into which many rivers fall is lighter, as of the Baltic, which is only 1·0067, and that of the B Sea, whose specific gravity has not been ascertained. I the water of the Mediterranean is more salt than that of Atlantic Ocean. In those parts of the ocean which proach the poles the water is of less specific gravity tha those parts which lie towards the equator, which may due to the melting of the enormous masses of ice which found in the lower latitudes.

Sea-water has repeatedly been analyzed; the latest res are stated under SEA-WATER. That of the Baltic conta only 1·18 per cent. of salt, but the water of the Mediterran contains 4·18 per cent.; the former being considerably low and the latter somewhat above the average of oceanic water. The sea is therefore a weak brine, fr which the salt may be extracted by the heat of the sun dryness of the climate.

Besides mineral substances, sea-water contains a slimy fetid matter, which imparts to it a nauseous taste, and, which is probably the produce of the decomposition of animal and vegetable substances, which abound in the sea. It has been observed that the sea-water, when not agitated for a long time, is very subject to pass into a certain state of putrefaction, and in that state it exhales very unpleasant odours, which are a real nuisance to the seaman. It is likewise known that some low coasts between the tropics are subject to diseases, which are attributed to the miasma arising from the sea after a long continuance of calm weather.

It has often been maintained that sea-water has no colour, but it is well known that the sea at a great distance from the land has an exceedingly fine ultramarine tint, which cannot be considered due to reflection from the atmosphere, as the colour of the sea is frequently of a deeper hue than that of the sky, and does not change even when the sky is covered with clouds. This colour undergoes some changes in shoals, where it is modified by the colour of the matter which forms the bottom. The greatest variety in the colour of the sea seems to occur in the Greenland sea between 74° and 80° N. lat., where it varies from ultramarine to olive green, and from the most perfect transparence to deep opacity. The green colour is liable to changes in its position, but still it is always renewed near certain situations from year to year. According to Scoresby, from whom we take this account, it frequently constitutes long bands or streams, lying north and south, or north-east and south-west, but of various dimensions, sometimes extending two or three degrees of latitude in length, and from a few miles to ten or fifteen leagues in breadth. This occurs very generally about the meridian of London, and the whales chiefly feed in this green-coloured water. When examined by Scoresby, it was found to contain a great number of semi-transparent spherical substances, with others resembling small portions of fine hair. The semi-transparent globules appeared to consist of an animal of the medusa kind, but Scoresby was unable to ascertain whether the fibrous or hair-like substances were living animals and possessed of locomotion.

The transparency of the sea-water seems to be connected with its colour. It is much greater than that of river-water, which contains much heterogeneous matter in suspension. The light penetrates to about the depth of 60 feet. This transparency of the sea-water increases with the distance from the shores, and is generally greater in the higher than in the lower latitudes, which may arise from the circumstance that the number of organic substances in the sea is much greater in warm climates. But there are many remarkable exceptions to the last-mentioned fact. Some parts of the sea between the tropics are distinguished by the transparency of their waters, especially the Caribbean Sea, where zoophytes and sea-plants, though growing on a bottom twenty or thirty feet deep, appear to be near enough to the surface to be plucked by a person in a boat: indeed some navigators pretend that the bottom of the sea may be seen at the depth of 150 feet. In the northern seas indeed it is asserted that the bottom may be seen at the depth of from 400 to 500 feet.

One of the most remarkable properties of sea-water is a certain luminous appearance, which has been observed in all seas, but appears in its greatest splendour between the tropics. In calm weather, when the water is moved by the motion of a vessel, the light assumes the form of brilliant stars, or round masses of a greenish hue, frequently eighteen inches in diameter. They float by the vessel in every part of the water which her bottom has touched, as deep as the lowest part of her keel, and form behind her a long and fiery train. At other times, when the breeze is strong, and the billows break and foam, the light appears like fields of flashing fire, through which the vessel is making her way. When the night is dark, the brilliancy of the water forms a beautiful contrast with the black concave of the sky; but as soon as daylight returns, the splendour disappears and the sea exhibits only its usual dingy colour. This extraordinary phenomenon has long attracted the attention of naturalists, who have endeavoured to explain it. Buffon and others supposed that it was produced by electricity excited by friction; for friction in most cases seems to assist in the production, if it be not essential to the existence of this brightness. The slight agitation of the water occasioned by the action of a steady breeze upon the surface is generally sufficient for producing it. But the hypothesis of Buffon is inadmissible, for the friction of fluid bodies never excites electricity. The common opinion at present is that it is chiefly owing to the presence of several kinds of animated beings, which have the power of emitting a phosphorescent light. It is however also supposed that it owes its origin partly to the decomposition and putrefaction of animal substances. The animalculæ, which emit a phosphorescent light, and are supposed to be most active in producing this luminous appearance of the sea, belong to the Mollusca, Crustacea, and Infusoria.

From the well-known laws of gravitation it is inferred that the surface of the sea is always at the same distance from the centre of the earth, and that consequently it forms a uniformly regular curve. This surface of course maintains the same level, and it is consequently the best basis from which to determine the relative elevations of the different parts of the land. But though the surface of the sea is a regular curve, minute investigation has shown that there are some irregularities, and that some parts of the sea are more elevated than others. This is particularly the case with closed seas, which are generally more elevated than the ocean. The level of the closed seas is higher than that of the ocean when the mass of water brought to them by the rivers which discharge into their basin is greater than that which is lost by evaporation, and the straits by which they are united to the ocean are not wide enough to carry off the surplus waters quickly. On the other hand, when the evaporation is greater than the supply of water from rivers, the level of the closed sea sinks below that of the ocean, and it must be supplied with water from the latter by the straits which unite them.

The Baltic, though of no great extent, and though united to the open sea by three straits, one of which is of considerable width, receives so great a supply of river-water, that its level is higher than that of the North Sea. Very exact measurement has shown that this difference amounts to more than a foot between the level of the North Sea near the mouth of the river Eider and that of the Baltic near the town of Kiel. It is true that when the level of the North Sea has been raised by a continuance of western and north-western winds, a current sets from the Cattegat into the Baltic, but in calm weather it is always found that the current sets northward through the three straits. The difference of level between the Black Sea and the Mediterranean is much greater. The large rivers which fall into the Black Sea bring down an immense volume of water; and accordingly a very strong southern current is constantly found to be setting southward through the Strait of Constantinople into the Sea of Marmora. It generally runs with a velocity of about three miles an hour, which however at one place, called the 'Devil's Current,' is much greater, and at times between five and six miles per hour. The velocity of this current must vary with the seasons; for it is stated that the level of the Black Sea in winter is between two and three fathoms higher than in summer. The Sea of Marmora, which thus receives the surplus of the waters of the Black Sea, must also be more elevated than the Mediterranean; for the current which sets through the Strait of the Dardanelles is likewise constant and rather quick, though not so quick as that in the Strait of Constantinople.

The Mediterranean, on the other hand, receives a very scanty supply of water by rivers; for with the exception of the Nile, no large stream falls into its basin, which is of much greater extent than that of other closed seas, and therefore it must lose a great volume of water by evaporation. Halley showed that the Mediterranean, whose temperature is from 4° to 5° Fahr. higher than that of the Atlantic under the same latitude, must lose by evaporation nearly three times as much water as is brought into it by the rivers. The deficiency is supplied in two ways: by the current of the Dardanelles, which brings to it the surplus waters of the Black Sea and of the Sea of Marmora; and by that which sets through the Strait of Gibraltar from the Atlantic Ocean. The Atlantic current runs somewhat more than one mile and a half per hour. It has been supposed that, though this current constantly sets into the Mediterranean, an under-current runs in an opposite direction, carrying back a portion at least of the water to the Atlantic; but the attempts which have been made to establish this fact have failed, and it is probable that this supposed under-current does not exist. Notwithstanding the large supply of water which the Mediterranean receives at its two extremities, the level is below that of the Atlantic. Coraboeuf found that the difference of level on the Mediterranean near Perpignan, and on the Bay of Biscay near Bayonne, amounted to nearly six feet; and Délambre and Mechain found it to be nearly three feet between the North Sea at Dunquerque and the Mediterranean near Perpignan.

In these instances the difference of level is satisfactorily explained; but the explanation is not so easy with respect to the great difference between the level of the Mediterranean and that of the Red Sea. These two seas are separated by the Isthmus of Suez, which extends about 70 miles from north to south. When the French occupied Egypt, they executed an extensive levelling across this isthmus; and the result was, that the Red Sea is above 32 feet higher than the Mediterranean. No river of importance, not even a perennial stream, falls into the Red Sea, which must also lose a considerable volume of water by evaporation. This loss of water is probably supplied by the current which sets into the Red Sea from the Indian Ocean; and some persons are of opinion that the difference of level between the Red Sea and the Mediterranean might be produced by this current. But it seems improbable that such an effect can be produced by this cause. According to Horsburgh and Wellsted (*London Geogr. Journal*, vol. vi., p. 82), a current sets from the Indian Sea into the Red Sea between October and May, and it often runs with great rapidity. But between May and October the northern winds prevail through the whole extent of the Red Sea; and these winds, which frequently blow a gale, cause a continual current to set through the straits into the Gulf of Aden. Under such circumstances, it is evident that the sea must fall to its natural level, especially as this state of things continues for more than three months. Wellsted observes that in this season, from May to October, the reefs in the northern part of the Red Sea have about two feet less water on them than in the remaining months of the year. This therefore appears to be the whole extent of the difference produced on the level of the Red Sea by the current, which enters it through the Strait of Bab-el-mandeb from October to May; but the French, as already observed, found the difference between the levels of the Red and Mediterranean seas to be not less than 32 feet. It would therefore appear that the Indian Ocean itself must be about 30 feet higher than the Mediterranean, and probably also higher than the Atlantic near the Strait of Gibraltar, and that the difference of level in the different parts of the ocean is much greater than is commonly supposed. This is also proved by the difference of level between the Atlantic and the Pacific on both sides of the Isthmus of Panama. According to Lloyd (*Philos. Transactions*, 1830), the mean rise and fall of the Pacific two days after full moon is 21·22 feet, and in the Caribbean Sea 1·16 feet. The water at high-water mark in the Atlantic is 13·55 feet lower than in the Pacific. The mean between the high and low water in the Pacific is 10·61 feet, and in the Atlantic 0·58. It would therefore appear that the level of the Pacific is 3·52 feet higher than that of the Caribbean Sea, as at low-water, two days after full-moon, the Pacific sinks 6·51 feet below the level of the Atlantic; but it rises at high-water 13·55 feet above it.

In this comparison of the level of the two oceans, the Caribbean Sea is placed in opposition to the Pacific; but in reasoning from existing data and our present knowledge, we must admit that the level of the Caribbean Sea is much higher than that of the Atlantic near the Old Continent. The north-eastern and eastern trade-winds force a great volume of water from the North Atlantic into the Caribbean Sea, and this is increased by another large volume of water which is brought to that sea by the Guiana current, and which enters it by the straits between the islands of Martinique and Trinidad. [ATLANTIC OCEAN, vol. iii., p. 29.] Such volumes of water, being arrested by the long isthmus which separates the Caribbean Sea and the Gulf of Mexico from the Pacific, must produce a considerable accumulation of water along the western shores of those seas, and raise them above the common level of the Atlantic, and this fact is confirmed by the rapid current called the Gulf Stream. [ATLANTIC OCEAN, vol. iii., p. 29.] Opinion varies considerably as to the difference of level between the Gulf of Mexico and the Atlantic. Poussin found the level of the Gulf at the mouth of the river Suwanee 3·75 feet higher than that of the Atlantic at the mouth of St. John's River in Florida; but when Darby, in his 'View of the United States,' estimates the difference between the Gulf near the island of Cuba and the entrance of Chesapeake Bay as at least [illegible] feet, we must suppose that he has formed his opinion on erroneous data. Also, we cannot accede to the opinion of Humboldt, who, in comparing some barometrical observations made at Cumana, Cartagena, and Vera Cruz, with others made at Acapulco and Callao, came to the conclusion that in these parts the Pacific was about 9·5 feet lower than the Caribbean Sea and the Gulf of Mexico. Lloyd found the reverse to take place at the mouth of the Chagres and at Panama, as we have mentioned above.

The bottom of the sea is similar to the surface of the land as to the irregular succession of elevations and depressions, and it is diversified by mountains and valleys and plains of different elevation. The summits of the submarine mountains rise above the level of the sea in the form of islands. In several parts large table-lands are found whose surface is not at a great depth below the level of the sea: when their surface is covered with sand, they are named sand-banks; and when it consists of coral rocks, coral-banks. Near the edges of these banks the depth of the sea is generally very great. The most extensive formation of these submarine table-lands occurs in the North Atlantic. Its most north-eastern portion is formed by the Outer Bank and the Great Bank of Newfoundland. [NEWFOUNDLAND, vol. xvi., p. 190.] West of the Great Bank of Newfoundland are Whale Bank, Green Bank, Banquereau, and Misaine Bank. The three last-mentioned banks are situated in front of the entrance of the Gulf of St. Lawrence. Opposite the coasts of Nova Scotia are Sable Bank and Le Have Bank, and then follow, in the same south-western direction, St. George's Bank, or the banks of Nantucket, which approach the continent of North America in the vicinity of New York. From this point the banks occur at a short distance from the shores of the United States, and extend, almost without interruption, to Cape Florida and Sable Point, the most southern extremity of the peninsula of Florida. West of this peninsula is the Tortuga Bank, the continuation of which skirts the shores of the United States in the Gulf of Mexico as far west as the mouths of the Mississippi. This series of banks occupies more than [illegible] miles in length; but there is always water enough on them for the largest vessels, with the exception of the Virgin Rocks on the Great Bank of Newfoundland, and the shoals of St. George's Bank. In all the other parts the least depth is not less than ten fathoms, and in general forty fathoms of water are found on them. The surface of these banks is very level. Along the northern and north-western edge, which lies opposite to the coast of America, the depth suddenly descends to 100 fathoms, and along the southern edge to 300 fathoms. The descent from the edge of the bank to the deep sea is nearly perpendicular. The banks, especially those north of 40° N. lat., are frequented by immense shoals of fish, especially cod.

The Columbian banks, under which name are comprehended all the banks which begin opposite the eastern shores of the peninsula of Florida and extend in a south-eastern direction to the Mona Passage between Haiti and Puerto Rico, are divided from the North American banks by the Florida Gulf-stream. They consist of two large banks, called the Little and Great Bahama Bank, which occupy the north-western portion of the group, and of five smaller banks, which occur at great distances from one another in a south-eastern direction. These banks have from 15 to 20 fathoms water on their edges, but they are beset with rocks and numerous shoals, of which a few are dry at low-water: they are therefore shunned by vessels. The surface of the banks consists of coral, covered with an accumulation of shells and calcareous sand. On their eastern edges, along the Atlantic, are the Bahama Islands.

Of the smaller banks which occur in the Atlantic we shall only mention the Bank of Arguin, which lies near the western coast of North Africa, beginning at Cape Blanco (21° N. lat.), and extending to the neighbourhood of Portendik (about 18° N. lat.). It is dangerous for navigators, as there are many parts in which the water is not deep enough for large vessels, many of which have been lost on it. The Abrolhos, near the coast of Brazil, between 16° and 18° S. lat., is not extensive, but it is extremely dangerous on account of the soundings being very irregular, varying between 36 and 4 fathoms. In two successive casts of the hand-lead the soundings frequently vary from 30 to 10, and sometimes even to 4 fathoms. As both banks, that of Arguin and the Abrolhos, abound in fish, they are much resorted to by fishermen.

There are several banks in the Indian Ocean: the most extensive are the Saya de Malha and the Bank of Nazareth. The Saya de Malha extends in length from north to south between 8° 18′ and 11° 30′, and is cut by 61° 30′ E. long. The surface is uneven, and in many places there are not more than between 6 and 10 fathoms water: it consists of corals and shells. The most southern extremity of the Nazareth Bank consists of the islands called Cargados, in 16° 47′ S. lat. and near 60° E. long. From this point the bank extends in a north-north-east direction to 14° S. lat. The surface is tolerably level, and the least depth of water does not fall short of 14 fathoms.

An extensive bank, called the Needle or Agulhas Bank, surrounds the southern extremity of Africa. It extends towards the west beyond the Cape of Good Hope, and towards the east beyond Cape Padrone, east of Algoa Bay. As it is not divided, like the other banks, from the continent by a tract of deeper water, it is not to be considered as a table-land, but as a submarine prolongation of the continent. Between Cape Agulhas (10° E. long.) and Cape Vaccas (22° E. long.), it extends to 37° S. lat., or to a distance exceeding 150 miles from the continent. The depth of water on this bank varies between 30 and 90 fathoms. The surface is composed of coarse sand, corals, shells, and small stones. Along its western edge it is skirted by a mud-bank, which is covered by water from 50 to 120 fathoms deep.

There are numerous banks in the Pacific, especially south of 20° N. lat. All the larger banks are surrounded by coral reefs, on which islands of small extent often occur. [Reefs.]

Near banks, the sea usually deepens to 200 and 300 fathoms, and even more; but in general we are very little acquainted with the depth of the deeper parts of the sea. Experiments have been made for determining whether the temperature of the sea-water increases or decreases in proportion to the depth; but only a few isolated spots in an immense space have been determined. We are however better acquainted with the depth of several close seas, especially those which are much navigated. The depth of the Baltic is inconsiderable; it usually varies between 30 and 40 fathoms, and only in two or three places sinks below 100 fathoms. The North Sea is somewhat deeper in its northern part. Between the Shetland Islands and the coast of Norway the depth varies between 80 and 140 fathoms, but it gets gradually shallower towards the south. In the Straits of Dover the deepest place is only 26 fathoms. The depth of the English Channel increases as we proceed towards the west, but very slowly. East of the Eddystone it does not exceed 50 fathoms. The Irish Channel is in general deeper. Though there are some places between Wales and Ireland in which it does not exceed 40 fathoms, its general depth may be said to vary between 60 and 80 fathoms; and in the strait between the counties of Antrim and Wigton in Scotland it attains 100 fathoms. The Mediterranean is much deeper than the Baltic and North Sea, more especially along the southern coast of Spain and about the island of Sardinia, where the depth varies between 500 and 1000 fathoms. A shallow tract extends from Trapani in Sicily to Cape Bon in Tunis: it is called by the Italian sailors *scherchi*, and is of inconsiderable but very variable depth. That portion of the Mediterranean which lies east of this shallow tract is not so deep as the western part. The Red Sea may be compared in depth with the eastern part of the Mediterranean. [Red Sea, xix., p. 344.] The sea which surrounds the islands of the Indian Archipelago seems nowhere to sink much below 50 fathoms.

The main body of the sea has a much greater depth. In most parts of the Atlantic, where the sea has been sounded, no bottom was found with 300 fathoms. It seems however that between Europe and America it is not so deep; but in these parts the bottom seems to offer great inequalities, being furrowed by deeper tracts, which run north and south. The small depth of this part of the Atlantic has given rise to the opinion that the sea round the North Pole is not so deep as that which surrounds the South Pole, but this opinion has no foundation. Phipps and Scoresby sounded in several places between Spitzbergen and Greenland with from 780 to 1200 fathoms, without finding a bottom; and Ellis and Ross did the same in Hudson's Bay and Baffin's Bay. In the Pacific Ocean the depth seems also to be very considerable, but few soundings have been made there.

The depth of the sea near the land varies with the nature of the shores. Where the country near the sea is elevated, and terminates in high and rocky shores, the sea is generally of considerable depth. Such shores have generally good and safe harbours. But when a low plain terminates on the sea with a flat sandy bank, the sea is shallow and frequently continues to be so to a great distance from the shore. In many places such shores are inaccessible even to boats, and vessels must keep at a distance of many miles. Such shallows consist either of sand or of mud. These low shores are generally destitute of harbours, or at least they occur only at great distances, and much expense is required to maintain them in an efficient state: the harbours on rocky coasts are not subject to this inconvenience.

It is a well established fact that places near the sea have a more uniform climate than those which are at great distances from it, though in the same latitude. Inland places experience a much greater degree both of heat and cold than places on the coast, and the difference between these degrees of heat and of cold increases with the distance of the place from the sea. This phenomenon has been variously explained. The explanation is now pretty clear, since it has been proved by observation that the temperature of the air over the sea is less subject to changes than, or rather does not undergo such great changes as, that of the air which is over the land. But as the temperature of countries situated between the tropics is not subject to so great changes as that of countries in the temperate zone, and these again are less affected by them than the frigid zone, so it is found to be the case on the sea also. Beginning with the smallest natural division of time, the day, it is found that between the tropics the difference of temperature within 24 hours seldom exceeds two degrees of Fahrenheit, and rarely amounts to more than three degrees. The following table from Meyen's 'Reise um die Welt' shows the changes of temperature on the sea during 24 hours between the tropics:—

1830, October 25; lat. 14° 17′ N., long. 26° 37′ W.

1h.	79·88°	9h.	80·96°	5h.	81·14°
2	80·06	10	80·96	6	81·14
3	80·06	11	80·96	7	81·14
4	80·06	12	80·96	8	80·96
5	79·88	1	81·14	9	80·78
6	79·70	2	81·50	10	80·96
7	79·70	3	81·96	11	80·24
8	79·70	4	81·68	12	80·24

The difference between the highest and lowest temperature is only 2·26°. The mean temperature of the day is 80·65°, which is only 0·95° above the lowest and 1·31° below the highest temperature. It must however be remembered, that during the day to which these observations refer, the vessel on which they were made advanced through nearly 1½ degrees of latitude, which of course must have had some effect on the temperature.

There is a greater difference in the daily temperature of the sea within the temperate zone; though when compared with the changes which occur in any place situated in the same zone, but not immediately on the shores of the sea, it will be found considerably less than in the latter. The following table from Berghaus, of the changes on the sea, may be compared with the changes in the temperature of London in the middle of March:—

March 16; lat. 51° 0′ N., long. 64° 11′ W.

1h.	43·7°	9h.	44·6°	5h.	43·7°
2	43·7	10	44·6	6	42·8
3	43·7	11	44·6	7	41·0
4	43·7	12	44·6	8	41·0
5	44·6	1	46·4	9	41·0
6	44·6	2	45·5	10	41·9
7	44·6	3	44·6	11	41·9
8	44·6	4	43·7	12	42·8

The difference between the maximum and minimum of the daily temperature in this table amounts to 5·4°, and the mean temperature of the day is 43·7°. The maximum is 2·7° above the mean temperature, and the minimum is 2·7° below it.

We come to the same conclusion that the temperature of the air over the sea is subject to less considerable changes than that which surrounds the land, when we compare the changes that occur during the seasons. Since the travels of Humboldt in South America were published, much attention has been paid to this subject. He was the first to publish a table representing the temperature of the air in places situated on the sea-shores at different seasons and in different latitudes, but since that time numerous observations have been made. We subjoin the table which Berghaus made from data which are the result of regular observation at sea.

Temperature of the Air incumbent on the Atlantic Ocean.

	Lat.	Winter.	Spring.	Summer.	Autumn.	Annual Mean.	Difference between Winter and Summer.
Northern Atlantic.	55° N.	40·82°	45·32°	57·92°	50·54°	48·56°	17·10°
	50	47·48	50·18	60·08	53·96	51·08	12·50
	45	52·16	55·58	63·86	55·94	56·84	11·70
	40	57·20	59·36	70·12	60·80	61·88	12·88
	35	61·88	66·02	76·28	68·36	68·00	14·40
	30	64·40	71·60	79·16	76·46	72·86	14·76
	25	68·36	76·64	79·52	77·36	75·38	11·16
	20	72·68	77·72	79·70	78·80	77·18	7·12
	15	73·40	79·70	81·14	80·06	78·70	7·74
	10	75·92	79·70	82·58	80·78	79·70	6·66
	5	79·16	80·60	80·96	80·42	80·24	1·80
	Line.	79·88	80·24	80·60	79·88	80·06	0·72
Southern Atlantic.	5° S.	78·80	79·34	80·42	79·88	79·52	1·62
	10	77·36	78·08	80·42	79·34	78·80	3·06
	15	74·66	77·00	78·08	77·90	76·82	3·42
	20	70·88	76·82	77·82	74·84	75·02	6·94
	25	67·90	71·06	72·82	69·44	70·52	5·92
	30	66·20	70·88	71·78	67·28	69·08	5·58
	35	56·30	59·18	67·64	65·66	62·24	11·34
	40	50·08	57·20	64·04	59·00	57·74	13·96
	45	41·90	47·48	53·60	47·48	47·66	11·70
	50	38·84	42·80	51·44	43·70	44·24	12·60
	55	33·80	37·40	42·80	36·50	39·38	9·00

Though the data on which this table is constructed have been obtained by regular and uniform observations, their number is not sufficiently great to give a result on which we can rely; we cannot obtain any tolerably exact notion of the temperature of the air at any given place on the land, except by observations continued for more than ten years. Besides, a much greater number of observations is requisite to determine the temperature of the air on the sea than on the land, on account of the difficulty of making exact observations on board a vessel: the above table therefore can only be considered as a very imperfect attempt to give something like an approximation to truth. Still, imperfect as it is, a few interesting facts may be inferred from it. In applying it first to the question whether the southern hemisphere is colder than the northern, we find that the greatest mean annual temperature is not on the equator, but in 5° N. lat. If the girdle which runs round our globe between 0° and 5° N. lat. is considered as the equator of temperature, from which the degrees are counted, we find a remarkable coincidence of nearly equal temperature between the corresponding degrees both of the southern and northern hemisphere, at least as far as 40° lat., that is to say, the temperature of 20° in the southern is about equal to that of 25° in the northern hemisphere. Hence it may be assumed as a general law, that the southern hemisphere is colder than the northern by five degrees of latitude. This difference however increases when we proceed south of 40° and north of 45°, but as our observations do not extend much beyond these parallels, it is impossible to say at what rate the decrease of heat in the southern hemisphere exceeds that in the northern.

Looking at the difference of temperature between the hottest and coldest season, we find that this difference is much greater and at the same time more irregular in the northern than in the southern hemisphere. But this may be accounted for. The great difference between the mean temperature of the winter and summer in 55° N. lat. is doubtless owing to the great masses of ice which during the former season extend as far south as 60°, and which during the prevailing northern gales must depress the temperature of the air very considerably. But this seems to be the only case in which the temperature of the winter is rendered irregular by a local phenomenon. For between 50° and 25° the increase of the mean temperature of the spring is tolerably regular, rising, except in one instance, which perhaps may be owing to an error, from 4½° to 5° for every five degrees of latitude. The other irregularities are evidently produced by a greater increase of the heat in summer. The mean temperature of the summer increases pretty regularly between 55° and 45° by from two to four degrees for every five degrees of latitude. But between 45° and 40° it rises suddenly to more than six degrees. This sudden rise is probably produced by the warm vapours arising from the Gulf stream, which in these parts runs across the Atlantic. Another rise of more than six degrees occurs between 40° and 35° N. lat. The air of the Sahara, when raised to the highest degree of heat by the continuance of the sun near the northern tropic, seems to affect the mean temperature of the summer between 40° and 15°, and to raise it nearly to the mean temperature of that season under the equator. We may suppose that the effect of this heated air ceases near Cape Verde, but the effects of another phenomenon begin to operate. The region of calms [ATLANTIC OCEAN, vol. iii., p. 26] frequently extends in summer to 12° and 15° N. lat. Of these three agents, the heated air of the Sahara seems to have the greatest effect in raising the summer temperature of the Atlantic. Though the table exhibits a much greater conformity between the coldest and hottest seasons in the southern hemisphere, there are two or three deviations from a regular course at 20°, 35°, and 40°, for which we are at present unable to account. We are rather inclined to attribute them to the insufficiency of the observations, or to some error which has crept in. It is however remarkable that these great differences are owing to the depression of the temperature in the winter season, and may perhaps be derived from some natural cause. The comparatively small difference between the mean temperature of the summer and winter in 55° S. lat., which amounts only to half of that which takes place in the northern hemisphere, is certainly owing to some natural causes, as Captain King is decidedly of opinion that the difference of these two seasons is not so great in the Strait of Magalhaens as in the same latitude in the northern hemisphere.

It is interesting to see how far the temperature of the sea and the changes it is subject to all the year round, differ from those of places which are situated near the sea, but whose temperature must be affected by the land. It would lead us too far from our object to enter fully into this matter. But that the reader may be convinced of the importance of such an investigation, we add the temperature of a few places situated on the shores of the Northern Atlantic or near them.

Temperature of some Places situated on the Shores of the Northern Atlantic.

NAMES OF PLACES.	Lat.	Winter.	Spring.	Summer.	Autumn.	Mean Temperature of the Year.	Difference between Winter and Summer.
Edinburgh	55° 58′	38·25°	45·70°	57·31°	46·98°	47·06°	19 [illegible]
London .	51 31	39·32	51·12	61·19	43·97	49·65	21 8[illegible]
Gosport .	50 48	40·71	44·80	63·46	52·97	51·48	22·7[illegible]
La Rochelle	46 9	40 60	51·76	66·60	53·24	53·06	26·[illegible]
Erasmus Hall (New York)	40 37	35·36	50·10	71·34	54·03	52·71	35·[illegible]
S. Augustine (Florida)	29 50	40·40	71·47	82 76	75·16	72·23	[illegible]
Sierra Leone	8 30	81·37	83·49	79·16	80·09	81·03	2·21

The table in the other column of this page shows the increase of the temperature of the air incumbent on the Atlantic Ocean in proceeding from the poles to the equator. There are some facts which seem to indicate that within the tropic the temperature of the air increases in proceeding from the coast of Africa to that of America, but the number of these facts is too small and the discrepancies between them too great to authorise us to infer from them any general law. The same observation applies to the temperature of the Pacific, which, on account of its greater extent, requires a much larger number of observations before any conclusion can be drawn from them.

When two elements, such as air and water, approach each other, there can be no great difference in their temperature. Still there must be some difference, as the air is the better conductor of heat, and the water, as a more dense body, is capable of retaining it for a greater length of time. Many observations have been made for the purpose of establishing this difference more precisely. It was found that the temperature of both was subject to regular changes during the day, but that the air attained its highest temperature about two o'clock, whilst the sea attained its highest temperature, according to some at three o'clock, and according to others not before four o'clock. Further, it has been ascertained that the temperature of the air is greater shortly before and after noon, and that of the sea about midnight, but in the morning and evening the two elements have the same temperature or nearly so. This is also stated to be the case between the temperature of the water of the Amazonas and the incumbent air. The wild tribes which inhabit its banks bathe in the river in the day time to cool themselves, and early in the morning for the purpose of getting rid of the chill which is caused by the cold air of the night. When these slight changes are excluded, it is found that the difference of temperature in both elements is either little or very inconsiderable, and that it hardly amounts anywhere to more than 3° Fahr. Very exact observers do not agree to which of the elements the higher temperature belongs. Humboldt thinks that the temperature of the sea is greater. In traversing the Northern Atlantic between 16° 20′ to 11° N. lat., he found the maximum of the temperature of the sea between 72·50° and 78·44°, and that of the air at the same place between 71·6° and 77·90°. Péron, who accompanied the expedition of Bourdin, is also decidedly of opinion that the temperature of the water is somewhat higher, at least between 49° N. lat. and 45° S. lat. Others however assert that the temperature of the air is higher; and this was the opinion of Irving and Forster. Berghaus, to whom were intrusted the numerous observations made upon a uniform plan in several voyages across the Atlantic, thinks that the air has a higher temperature between 35° N. lat. and 20° S. lat., but that in the higher latitudes the temperature of the surface of the sea is higher. He has embodied an abstract of these observations in the following table:—

Mean Temperature of the Air and Sea of the Atlantic Ocean.

Northern Atlantic.				Southern Atlantic.			
Lat.	Air.	Sea.	Difference.	Lat.	Air	Sea.	Difference.
	°	°	°		°	°	°
56°	48·56	49·64	+1·08	55°	39·38	41·00	+1·62
50	51·08	53·96	+2·88	50	44·24	48·02	+3·80
45	56·84	57·74	+0·99	45	47·66	52·52	+4·86
40	61·88	62·24	+0·36	40	57·74	58·64	+0·90
35	68·00	66·92	−1·08	35	62·24	64·40	+2·16
30	72·86	69·80	−3·06	30	69·08	69·26	+0·18
25	75·38	71·78	−3·60	25	70·52	71·60	+1·08
20	77·18	74·30	−2·88	20	75·02	73·58	−1·44
15	78·70	76·10	−2·60	15	76·82	75·90	−1·08
10	79·70	78·26	−1·44	10	78·80	77·72	−0·92
5	80·24	80·24	−0·00	5	79·52	78·44	−1·08
Equ.	80·06	78·98	−1·08	Equ.	80·06	78·98	−1·08

This table, as Berghaus states, is the result of numerous observations, and seems therefore to be entitled to some credit. As it established a new principle in this matter, we looked for confirmation of it in the numerous observations made by Captain Fitzroy during the surveying voyages of the Beagle, which are contained in the abstract of his 'Meteorological Journal' in the appendix to the Surveying Voyages. But the observations of this able navigator do not confirm the table, so far as it establishes the higher temperature of the air between the tropics. On the contrary, if those observations are eliminated, which he made near the land, and a few others, where probably local circumstances were operating, he found the temperature of the water constantly higher than that of the air, and sometimes as much as 5°.

Winds must of course affect the temperature of both elements. It has been constantly observed that high gales depress the temperature of the air, but it has been maintained that they increase that of the sea by the agitation of the waves. But the observations of Péron appear to have established the contrary, as he always found that the temperature of the water was diminished during a gale, but at a much slower rate than that of the air. In common cases he thinks that the decrease of the temperature of the air during gales, compared with that of the water, is as 1:6. How great a difference between the temperatures of the two elements may be produced in such a case, we learn from Weddell, who, when in 53° S. lat., experienced a chilling south wind, in which the difference was ten degrees, the temperature of the air being 39·30°, whilst that of the sea was 49·30°.

It is a very remarkable phenomenon, which has not yet been satisfactorily explained, that the temperature of the sea decreases as the land is approached, and it also decreases on shoals and banks; and as this decrease may be detected by the thermometer at a considerable distance from land, this instrument is now used for the purpose of ascertaining the approach to land or the presence of shoals. It must however be observed that though this decrease generally takes place, it is not universal. Fitzroy, when surveying the most dangerous of all banks, the Abrolhos, did not observe the least change in the temperature of the water; but a change is observed on all the banks which skirt the eastern shores of North America from the Great Bank of Newfoundland to the mouth of the Mississippi. We find also that when Fitzroy approached the continent of South America in his surveying voyages, the temperature of the sea sunk below that of the air. It must however be admitted that some competent judges are of opinion that the temperature of the sea increases as we approach the land, among whom is Péron. But the evidence against him is so abundant and strong, that this point may perhaps be considered as settled.

As late as the end of the last century it was a generally received opinion that the whole mass of sea-water, from the surface to the bottom, had the same temperature in the same latitude. But numerous observations, which have been more recently made, have shown the inaccuracy of this assumption. It has been found that the law which is constant for the earth must be inverted for the sea. The farther we descend into the interior of the earth, the higher is the temperature; but the deeper we dip into the sea, the lower is the temperature of the water. But this does not take place in the same ratio in the whole sea. Captain Ross found the temperature of the sea in Baffin's Bay, 3900 feet below the surface, + 25·52°, while the surface itself was + 33·80°. Beechey, in 47° 18′ N. lat., at a depth of 5124 feet, found the water + 39·56°, and at the surface it was 46·22°. Sabine found that the water in the Caribbean Sea, at a depth of 1000 fathoms, had a temperature of 45·50°, whilst at the surface it was 83·30°. According to an observation of Franklin, the water at a depth of 650 fathoms, in 57° 44′, was 40·5°; at 450, it was 41°; and at the surface, 45°. These instances show that the change of temperature is by no means connected with the latitude. Almost all the observations which have been made tend to show that the temperature near the surface decreases very slowly, and more rapidly at a certain distance from it; but at a great depth it again decreases at a slower rate, and afterwards it becomes stationary. There are a few instances in which a new increase of the temperature has been observed at a very great depth. In the following observations made by Beechey, in the Pacific, the temperature became stationary at a great depth:—

23° 28′ N. lat.		*58° 48′ N. lat.*	
Temp. at the surface	63°	Temp. at the surface	54°
At a depth of 300 ft.	62°	At a depth of 600 ft.	45°
At a depth of 900 ft.	50°	At a depth of 1200 ft.	41°·5
At a depth of 1260 ft.	47°·5	At a depth of 1962 ft.	40°·5
At a depth of 1860 ft.	47°·5	At a depth of 2652 ft.	40°·5

As a proof of the increase of the temperature of the sea at a great depth, we copy the following observations, of which the two first were made by Beechey, and the last by Prescott; the first in the Pacific, and the two last in the Atlantic Ocean:—

14° 22′ N. lat.		*55° 58′ S. lat.*	
Temp. of the air	91°	Temp. of the air	37°
Of the sea at its surface	88°	Of the sea at its surface	43°·5
At a depth of 600 ft.	57°	At a depth of 600 ft.	42°·5
At a depth of 1200 ft.	55°	At a depth of 1380 ft.	42°·5
At a depth of 1800 ft.	48°·5	At a depth of 1980 ft.	40°·5
At a depth of 2400 ft.	49°·5	At a depth of 2580 ft.	41°·5

12° 22′ N. lat.	
Temp. of the air	83°
Of the sea at its surface	82°
At a depth of 180 ft.	71°
At a depth of 360 ft.	61°
At a depth of 540 ft.	57°

At a depth of 660 ft.	58°
At a depth of 720 ft.	58°
At a depth of 1320 ft.	60°

The renewed increase at a great depth is a very difficult problem to solve: it is possible that it may be owing to submarine currents of different degrees of temperature, as some have supposed.

But there are facts on record which clearly show that in certain parts of the ocean there must exist some agency by which the water acquires a higher degree of temperature than could be expected from natural causes. Horner, in Krusenstern's 'Travels,' observes that in some places in the Gulf-stream the hand-lead, when it had descended to a depth of between 480 and 600 feet, was heated to such a degree that it was impossible to take it into one's hand. A still more remarkable anomaly is presented by the temperature of the sea between Greenland and Spitzbergen. In nearly every trial Scoresby found that this sea at a depth of from 100 to 200 fathoms was from 6° to 7° warmer than at the surface; and Franklin states that when he accompanied Captain Buchan in his expedition to the North Pole, the water brought from any great depth was invariably found to be warmer than that of the surface. Some persons are of opinion that the melting of the great masses of ice, by which that sea is surrounded and partly covered even in summer, may have had the effect of cooling the surface. But this is contrary to the well established law that the colder water, being the denser, sinks to the bottom, and the warmer rises to the surface; and further, it may be asked why Ross and Parry, in navigating Davis's Strait, Baffin's Bay and Hudson's Bay, where the masses of ice are neither less numerous nor less extensive, always found the contrary to take place.

Masses of ice surround the two poles. It is probable that in the vicinity of the poles the ice constitutes one continuous and unbroken mass. It was formerly conjectured that the mass of ice supposed to enclose the North Pole extended to the vicinity of 81° N. lat., because all navigators who had attained that latitude agreed in stating that the ice there rose to a great height, and stood firm like a wall. This general opinion gave rise to the attempt of Captain Parry to reach the pole by travelling on this ice, which was supposed to be immovable. But Parry was soon aware that he was travelling on ice which was in motion towards the south and south-west, and this circumstance occasioned the failure of the undertaking. When he had advanced, according to his calculation, several miles to the northward in twenty-four hours, he found, on observing the altitude of the sun, that the motion of the ice had carried him as far southward, and that for several days he had advanced very little nearer to his object. He was obliged to abandon the attempt, after having nearly reached 83° N. lat. Thus we have learned that the exterior parts of the great mass of ice supposed to enclose the poles consists of moving masses, which lie close together, and are only occasionally divided from one another by narrow straits. The pieces of ice which detach themselves from this great accumulation and enter the open sea are called *heavy drift-ice*. The larger pieces of ice of this description are a mile in length and breadth, and upwards of thirty feet in thickness, but others are of less dimensions. The farther they advance southward, the more their dimensions are reduced by the action of the sun and of the water. But there are two other descriptions of ice-masses in the sea, which appear to have a different origin, the ice-fields and the icebergs. The term *ice-field* is applied to sheets of ice so extensive that their limits cannot be discerned from the mast-head. They often occur of the diameter of twenty or thirty miles, and, when they are very closely united, they sometimes extend to the length of fifty or a hundred miles. Their average thickness may be from ten to fifteen feet, and their surface is mostly level, except where *hummocks* or low ice-hills occur, and then the thickness is often forty and even fifty feet. These hummocks are produced by two fields coming into contact, when their broken edges are raised by the violent concussion, and thrown upon the fields themselves. These hummocks therefore are usually situated near the edges of the field. In some fields the hummocks form ridges or chains; in others they consist of isolated peaks. The smaller fields, or those whose extent can be seen from the mast-head, are called *floes*. The surface of these masses of ice, before July, is always covered with a bed of snow from a foot to a fathom in depth; this snow dissolves in the end of summer, and forms extensive pools and lakes of fresh water. The great extent and the level surface of the fields show that they cannot be portions of the ice over which Parry travelled. It is therefore supposed that they are generated in the sea which lies between Greenland and Spitzbergen, and which, though navigable during the summer, is covered with a continuous sheet of ice in the colder season. The fields appear to be the parts of this great sheet, formed by its breaking up at the approach of summer. The *icebergs* are immense pieces of ice rising to a great height above the level of the sea; some of them attain a height of 100 feet above the surface of the sea, and a few have been found which seem to be more than twice that height. Their base near the sea-level is not extensive, the larger masses generally being not more than 4000 feet in circumference, though Middleton states that he saw one which was from three to four miles in circuit. The most common form of the iceberg is for one side to rise perpendicularly to the very summit, the opposite side being very low, while the intermediate surface forms a gradual slope. Some have regular flat surfaces, but frequently they present a great variety in form and appearance. Some of them resemble palaces, or churches, or old castles, with spires, towers, windows, and arched gateways; while others resemble pyramids and obelisks, and others are like ships, trees, animals, and human beings. When a number of them are near one another, which frequently happens, they present the appearance of a mountainous country. When seen from a short distance, they look like huge hills of marble; and when the sun shines on them, they glitter like silver. Sometimes earth, gravel, and sand may be observed in them. Their prevailing colour in the fresh fracture is greenish-grey, approaching to emerald-green. This colour resembles that of the glaciers of Switzerland, and the icebergs are pieces broken off from glaciers. They are rarely met with in the sea between Greenland and Spitzbergen, because in these parts only a few glaciers approach near the water's edge. But on both sides of Davis's Strait and Baffin's Bay, and also on the eastern shores of Greenland* as far north as 70 N. lat., glaciers cover the land, and in many places advance to the shores of the sea. In some places they terminate in a precipitous edge on the coast. It is only in the sea which surrounds these coasts that the icebergs are numerous. They seem to owe their origin to the circumstance of glaciers being in a continual state of progress. The glaciers of Greenland, which are situated on the margin of the sea, protrude their exterior parts over the ocean, and in summer, when the ice becomes brittle, the force of cohesion is overcome by the weight of the prodigious masses that overhang the sea, and they are detached from the glacier with a dreadful crash. Thus an iceberg is formed. These icebergs, as it seems, are most common along the eastern shores of Greenland, and at the distance of 15 to 20 miles from the coast, where they occur by hundreds and thousands, forming a sort of barrier outside the drift-ice which is near the shore, and preventing its removal by an off-shore wind. Graah states that this barrier of icebergs renders it impossible for vessels to approach these shores.

These masses of ice render navigation very dangerous, and the ice-fields especially have caused the loss of many whaling-vessels. These extensive masses are frequently put into a rotatory movement by a cause which has never been discovered. When thus whirled about, their outer edges acquire a velocity of several miles per hour. A field thus in motion, coming in contact with another at rest, or with one that has a contrary direction of movement, produces a dreadful shock. A body of more than ten thousand millions of tons weight, meeting with resistance, when in motion, produces a destruction which it is scarcely possible to conceive. The strongest ship is a mere atom between two such masses of matter in motion, and many vessels have thus been destroyed. Some have been thrown upon the ice, some have had their hulls completely torn up or split in two, and others have been run down by the ice, and buried beneath its fragments. The ice-fields are particularly dangerous in foggy weather, as their motions cannot then be distinctly observed. Icebergs are much less dangerous, partly on account of the small space which they occupy when compared with ice-fields, and partly because they are easily distinguished at a distance in the night by their natural brightness, and in foggy weather by a peculiar blackness of the atmosphere. As however they occur far from land and often in unexpected situations, sailors when crossing the

Atlantic between 50° and 60° N. lat., or even farther to the south, must always be on the watch for them in the night time. Occasionally the whale-fishers derive some advantage from them. As they sink deep into the sea, they are very little affected by the wind, and they furnish secure mooring to a ship in strong adverse winds, or when it is required for other purposes. But mooring to lofty icebergs is attended with considerable danger. Being sometimes very nicely balanced, they are apt to lose their equilibrium; and vessels have often been staved and sometimes wrecked by the fall of their icy mooring, while boats have been overwhelmed even at a considerable distance by the swell occasioned by such a catastrophe. Water is sometimes procured by whaling-vessels from the deep pools of water that are formed in the summer season on the depressions in icebergs, or from the streams which run down their sides. For this purpose casks are landed upon the lower bergs, and filled and rolled into the sea, but from the higher the water is conveyed by means of a long tube of canvas or leather into casks placed in the boats at the side of the ice, or even upon the deck of the ship.

On approaching a field or any compact aggregation of ice, the *ice-blink* is seen whenever the horizon is tolerably free from clouds, and sometimes even under a thick sky. It consists of a stratum of lucid whiteness, which appears over the ice in that part of the atmosphere which joins the horizon. A clear sky presents a beautiful and perfect map of the ice, 20 or 30 miles beyond the limit of direct vision, but less distant in proportion as the atmosphere is more dense and obscure. Each kind of ice has a different blink. Field-ice has the most lucid blink, accompanied with a tinge of yellow; that of packed ice is more purely white; and ice newly formed upon the sea has a greyish hue.

According to the experiments of Scoresby, the specific gravity of the ice, when compared with that of sea-water occurring in the Greenland Sea, at the temperature of 35°, was ascertained to be 0·894 to 0·900. That part of the ice therefore which is above the surface appears to be, to that below the surface, in the proportion of 1 to 8·2. For every solid foot of ice which is seen in a mass floating in the sea, there must be at least eight feet below. Hence it sometimes happens that large icebergs, when they are carried into shallow water, take ground, and remain stationary for one or two years, until so much of their volume has been wasted by the action of the sun and of the atmosphere, that they begin to float again.

It excited some surprise when it was discovered that the ice floating about in the sea consisted of fresh water. It is true that it generally contains a very small portion of salt, but it is probable that this small portion of salt is derived from the salt water contained in the pores of the ice. If, says Scoresby, in confirmation of this opinion, the newest and most porous ice be removed into the air, allowed to drain for some time in a temperature of 32° and upwards, and then be washed in fresh water, it will be found to be nearly quite free from salt, and the water produced from it may be drunk. On account of the salt contained in it, sea water does not, like pure water, freeze at the temperature of 32°, but in the Greenland Sea, where its specific gravity is 1·0263, it begins only to freeze at 28½°. Water saturated with sea salt remains liquid at a temperature of zero.

It appears that there is scarcely any portion of the surface of the sea which is not subjected to some kind of motion, and this circumstance must tend greatly to preserve its purity. The water in some parts of the sea is always propelled in the same direction by the currents. [CURRENTS; ATLANTIC OCEAN; PACIFIC OCEAN.] Nearly the whole sea is four times in the day subject to a change in its level by the movements of the tides. The motion produced by the winds, and known by the name of waves, is much less regular. The wind striking the surface of the sea in an oblique direction, pushes some of the water on the surface over that which is contiguous to it, and thus raises it above the common level, until so much water is accumulated that the wind is unable to maintain it in that position, and it falls down. Each wave presents a gently ascending surface to the windward, and a perpendicular descent leeward. The elevation of the waves varies according to the strength of the wind. A rather heavy gale raises them from six to eight feet above the common sea-level; but in very strong gales they attain an elevation of thirty feet. This motion of the surface of the sea is not perceptible to a great depth. In the strongest gales it is supposed not to extend beyond 72 feet below the surface, and at a depth of 90 feet the sea is perfectly still. The form and even the size of the waves vary according to the depth and the extent of the sea. In shallow water, where the lower part of the waves approaches the bottom, and meets with resistance, the waves are abrupt and irregular, and this is also the case in confined seas; whilst on the open ocean they are wide and long, and rise and fall with great regularity. When the waves run to a low shore, the slope of the ground breaks their force, and they terminate in a tranquil manner; but when they are impelled against an elevated rocky coast, being repelled by the rock, they produce what is called a *surf*. This violent rising of the sea on a rocky coast sometimes attains an elevation of 100 feet above the sea-level. The surf is always dangerous to pass, except in boats of a peculiar construction. The waves do not subside simultaneously with the wind. The sea continues in its agitated state for many hours. The air being little agitated, or not at all, is unable to depress the undulations of the sea, and therefore the waves during a calm after a gale rise higher, and their most elevated part forms a more acute angle than during the gale. Such a state of the sea is called a *hollow sea*.

The proportion which exists between the sea and land has contributed to maintain the productive powers of the earth. If that proportion were materially changed, its productive powers would be changed also. The sea, by means of the vapours continually rising from its surface, supplies the atmosphere with sufficient moisture for the support of organic life. Countries which do not partake of the benefits derived from this source, and which are not refreshed by rain or dew, are uninhabitable and destitute of all kinds of vegetation. Those parts of the earth which are farthest from the sea are much less fertile and populous than those which, owing to their greater vicinity to it, receive a larger supply of moisture from this great source. The sea contributes also considerably to the advancement of civilization. At the first view it seems to constitute an insuperable obstacle to the communication between nations who inhabit countries widely apart from one another; but the ingenuity of men has converted the ocean into the most frequented high road on the globe. The easy communication which is thus established between nations at great distances from one another, has perhaps more than any other circumstance contributed to improve the condition of the human race. It is at least certain, that all those nations which have acquired any considerable degree of civilization inhabit countries either contiguous to the sea or at no great distance from it.

SEA-WATER, *Saline Contents of.* Although the saltness of the ocean must have attracted the notice and excited the curiosity of mankind in the earliest ages, yet the investigation of the nature and proportions of the several salts has been accurately conducted only within a comparatively few years. The most abundant principle is common salt, it constituting nearly two-thirds of the whole saline matter, which fluctuates between three and four per cent.; the specific gravity of the water varies, according to the proportion of the saline ingredients, from about 1·026 to 1·030. The late Dr. Marcet made some interesting experiments on this subject, and the general conclusions which he drew from them are thus stated by Dr. Prout, in his 'Bridgewater Treatise:'—

1. That the Southern Ocean contains more salt than the Northern Ocean, in the ratio of 1·02919 to 1·02757.

2. That the mean specific gravity of sea-water near the equator is 1·02777, or intermediate between that of the Northern and that of the Southern hemispheres.

3. That there is no notable difference in sea-water under different meridians.

4. That there is no satisfactory evidence that the sea at great depths is more salt than at the surface.

5. That the sea in general contains more salt where it is deepest and most remote from land, and that its saltness is always diminished in the vicinity of large masses of ice.

6. That small inland seas, though communicating with the ocean, are much less salt than the ocean.

7. That the Mediterranean contains rather larger proportions of salt than the ocean.

Dr. Marcet afterwards mentions that sea-water contains a double sulphate of potash and magnesia, hydrochlorate of ammonia and carbonate of lime, whilst chloride of calcium and nitrates are absent, as also mercury or mercurial salt, which it had been stated by Rouelle to contain.

Dr. Marcet justly observes, that the discovery of some substances not previously known to exist in sea-water, and the absence of others which it was supposed to contain, will require that former analyses of sea-water, and his own in particular, should be corrected and revised; and this is become even more necessary since Dr. Marcet wrote, for two new elements, viz. iodine and bromine, have been discovered in the waters of the ocean.

Omitting therefore all previous analyses, we subjoin two, the first by M. Laurens, of the water of the Mediterranean (*Journal de Pharmacie*, xxi. 93):—

	Grains.
Water	959·06
Chloride of Sodium (common salt)	27·22
Chloride of Magnesium .	6·14
Sulphate of Magnesia .	7·02
Sulphate of Lime . .	0·15
Carbonate of Lime . .	0·09
Carbonate of Magnesia .	0·11
Carbonic Acid . .	0·20
Potash	0·01
Iodine—quantity undetermined	
Extractive Matter—a trace	
	1000·

M. Laurens states that he could not detect the presence of any bromine in the water, though he made repeated trials for that purpose.

More recently Dr. G. Schweitzer has examined the water of the English Channel near Brighton. His results are,—

	Grains.
Water	964·74372
Chloride of Sodium . .	27·05948
Chloride of Magnesium . .	3·66658
Chloride of Potassium . .	0·76552
Bromide of Magnesium . .	0·02929
Sulphate of Magnesia . .	2·29578
Sulphate of Lime . .	1·40662
Carbonate of Lime . .	0·03301
	1000·

The specific gravity of the water was 1·0274, and it was the same when taken from the bottom of the sea ten fathoms deep. Iodine could be detected only in the minutest quantity; 174 pounds troy of sea-water of the Channel not containing one grain of it.

Dr. Schweitzer remarks, that when these analyses are compared, the Channel water contains nine times as much lime as the Mediterranean, which is to be accounted for by its flowing over a bed of chalk; the water taken in a fair calm day, when very transparent, did not yield the slightest trace of extractive matter. It contains minute traces of free carbonic acid, which probably holds the carbonates of lime and magnesia in solution as bicarbonates; and traces of hydrochlorate of ammonia were obtained, as had been formerly done by Dr. Marcet.

Dr. Schweitzer states that the potassium exists in the state of chloride; while, according to Dr. Marcet, it is in the form of a double sulphate of potash and magnesia, and this we are of opinion is the correct view of the case.

The water of the Dead Sea, according to Dr. Marcet, has a specific gravity of 1·211; and by his analysis 1000 grains consist of—

	Grains.
Water . . .	754·20
Chloride of Sodium . .	103·60
Chloride of Calcium . .	39·20
Chloride of Magnesium .	102·46
Sulphate of Lime . .	·54
	1000·

M. Gay-Lussac's analysis gives 16·6 grains more of saline contents, and he differs considerably from Dr. Marcet as to the proportions of the various salts.

While the substances above described may be regarded as the usual saline constituents of sea-water, it has been lately shown by Professor Daniell (*London, Edinburgh, and Dublin Phil. Mag.*, July, 1841), that the waters of the western coast of Africa and other localities spontaneously evolve sulphuretted hydrogen, and in very considerable quantities. It will be sufficient to state one example:—Water from the river Bungo, taken at sea at forty miles distance from the mouth, contained in the imperial gallon 4·35 cubic inches of sulphuretted hydrogen gas. It appears that this gas, so prejudicial to health, and so destructive to the copper of ships' bottoms, contaminates the sea upon the western coast of Africa in enormous quantities through an extent of more than 15° of latitude, and reaching in places forty miles seaward, making altogether an area of 40,000 square miles in extent.

Professor Daniell has shown, we think satisfactorily, that the production of this gas is owing to the mutual reaction of the immense quantities of vegetable matters which must be brought down by the intertropical rivers, and the sulphates of sea-water. For an account of the modes which Professor Daniell has proposed of avoiding the evil effects of this gas, both on the health of man and the coppering of ships, we refer to the work above quoted.

SEA-BEAR. [BEAR, vol. iv., p. 192; SEALS.]

SEA-CALF. [SEALS.]

SEA-COW. [SEALS.]

SEA-DUCKS. [FULIGULINÆ.]

SEA-EGGS. [ECHINIDÆ.]

SEA-ELEPHANT. [SEALS.]

SEA-LEOPARD. [SEALS.]

SEA-LION. [SEALS.]

SEA-MOUSE. Cuvier remarks that the *Aphrodita* of Linnæus is easily recognised among the *Dorsibranchiate Annelids* [ANNELIDA; DORSIBRANCHIATA] by the two longitudinal rows of wide membranous scales which cover the back, and under which are hidden their *branchiæ*, in the form of small fleshy crests. Their body is generally flattened in form, and shorter and wider than it is in the other Annelids. Their very thick and muscular œsophagus is capable of being extruded like a proboscis. They have an unequal intestine, furnished on each side with a great number of branched cæca, the extremities of which go to fix themselves between the bundles of bristles that serve for feet.

No. 442 A., *Mus. Coll. Chir.*, exhibits a Sea-Mouse, laid open longitudinally, to expose the alimentary canal. The first division of this canal is commonly considered as the stomach, but it is rather a preparatory organ than a true digestive cavity, and is protruded like a proboscis when the animal takes its food, as above noticed. It is seen in the preparation to be strong and muscular, like a gizzard, and communicates with the second portion of the canal by a narrow passage. The true digestive cavity is wide and membranous, and has a series of elongated cæcal appendages passing from it on each side. No. 782 of the same museum shows the alimentary canal and intestinal cæcal appendages. The intestine is laid open, displaying the orifices of the cæca, into some of which orifices bristles have been inserted. The author of the catalogue remarks that this preparation is called by Mr. Hunter, in the original manuscript catalogue, the 'Intestinal canal and liver of the Sea-Mouse,' evidently regarding the cæcal appendages as representing that viscus. Thus, after exhibiting the salivary glands under the form of elongated cæca in the Holothuria and the pancreas under the same form in the osseous fishes he lastly shows us the complicated liver of the higher classes also commencing in the animal series by separate and simple follicles. No. 783 consists of the intestine and hepatic cæca. The dilated extremities of the latter are filled with a dark-coloured substance, with which the intestine is much distended. (*Cat.*, vol. i.)

Savigny's *Halithææ* consist of those which have three tentacles, and, between them, a very small crest: they are without jaws.

Example, *Halithæa aculeata*, *Aphrodita aculeata*, Linn., the *Sea-Mouse*.

This is a very beautiful animal, and most superbly coloured. It is oval, six or eight inches long, and two or three wide. The scales of the back are covered and hidden by a kind of flocky down, like tow, which springs upon the sides, and from which issue groups of strong spines, that pierce, in part, the flocky covering, and bundles of flexuous bristles glittering like gold, and changing into all the colours of the rainbow. Cuvier says, and without exaggeration, that they do not yield in beauty either to the plumage of the Humming-birds nor to the most brilliant precious stones. Lower down is a tubercle, out of which come spines, in three groups, and of three different sizes, and finally a fleshy cone. There are forty of these tubercles on each side, and between the two first are two small fleshy tentacles. There are fifteen pairs of scales, which are wide and sometimes puffed up, on the back, and fifteen small branchial crests on each side.

Some of the *Halithææ* (*Halithées Hermiones*, Sav.) have no flocky down upon the back, and such is *Aphrodita Hystrix* (genus *Hermione*, De Blainv.).

The genus *Polynöe*, Sav. (*Eumolpe*, Oken), is another subdivision. This genus has no flocky covering on the back; the tentacles are five in number, and their proboscis is furnished with horny and strong jaws. *Polynöe lævis* is an example.

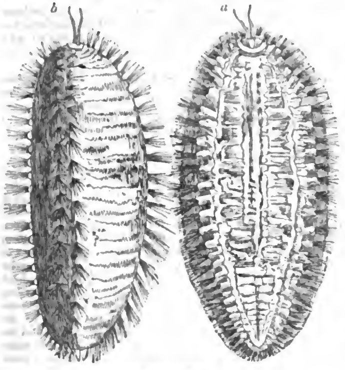
Then there are the genera *Sigalion* and *Acoëtes* of MM. Audouin and Milne Edwards.

The first of these is more elongated in form than the other *Aphroditæ;* it has cirrhi on all the feet. Such is *Sigalion Mathildæ*.

The second has cirrhi, which alternate with the *elytra* (as the two rows of membranous scales which cover the back are somewhat oddly called, the term being already applied to the horny external wings of coleopterous insects), in great length; their jaws are stronger and better toothed. There is a large species at the Antilles, which inhabits a sheath or pipe of the consistence of leather.

Here Cuvier places his *Chætopterus*, which has a mouth devoid of jaws and proboscis, furnished above with a lip, to which are attached two very small tentacula. Then comes a disk with nine pairs of feet, then a pair of long bristly bundles, like two wings. The *branchiæ*, in the form of plates, are attached rather below than above, and are placed along the middle of the body.

Example, *Chætopterus pergamentaceus*. This is eight or ten inches long, and inhabits a pipe of the substance of parchment, in the seas of the West India Islands.



Aphrodita aculeata.
a, ventral view; *b*, dorsal and lateral view.

SEA-PIE, one of the names for the *Oyster-catcher*, *Hæmatopus ostralegus*, Linn.

Generic Character.—Bill long, strong, compressed; point very much compressed, chisel-like. Nostrils lateral, longitudinally slit in the groove of the bill. Feet strong, muscular; three toes directed forwards, middle toe united to the external one, up to the first joint, by a membrane, and to the internal toe by a small rudiment; toes bordered with the rudiment of a membrane. Wings moderate, the first quill longest.

Habits of the Genus.—The species live along the seashore, on the beach or sands; following the retreat of the waves, to gather such crustaceous or marine animals as they wash up. They assemble in great flocks for their migrations, but live solitarily during the time of pairing and incubation. Their nests are made in the herbage and in the marshy meadows near the sea, and they both run and fly with rapidity. Their cry is shrill and resounding. They moult twice, in autumn and spring, but the colours of the plumage scarcely change at all at those periods; the only marked difference observed, at this change of plumage, exists in the absence or presence of the white gorget. There is no difference in the sexes. (Temm.)

Example, *Hæmatopus ostralegus*.

Description.—Male and Female in Winter Plumage.—Head, nape, upper part of the breast, back, wings, and extremity of the tail, deep black; a very marked gorget under the throat; rump, origin of caudal feathers and quills, transverse band on the wings, as well as all the lower parts, pure white; bill and naked circle round the eyes, very bright orange; iris crimson; feet obscure red.

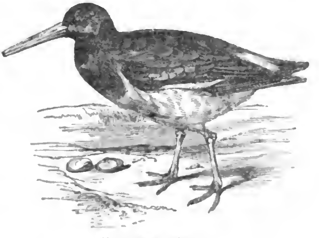
Young of the Year.—These have the black of the plumage clouded and bordered with brown; the white dirty; bill and naked circle of the eyes blackish brown; iris brown; feet livid grey.

Summer or Nuptial Plumage.—All the upper parts of the front of the neck of the same black as the wings, which black is more lustrous, and with reflections. (Temm.)

This is *L'Huiterier*, *Pie de Mer*, and *Becasse de Mer* of the French; *Beccaccia di Mare* of the Italians; *Marspitt* and *Strandskjura* of the Swedes; *Tialldur* (fem. *Tilldra*) of the Icelanders; *Kielder* of the Feroe Islanders; *Tield*, *Kield*, *Glib*, and *Strand-Skiure* of the Norwegians; *Strand-Skade* of the Danes; *Geschackte Austernfischer* of the Germans; *Scholackster* of the Netherlanders; *Oyster-catcher* and *Sea-Pie* of the modern British; and *Piogen y Môr* of the antient British.

Geographical Distribution.—The whole of the European continent. Common in Denmark, Sweden, and Norway, Russia, Siberia, and extending to Kamtchatka; the British Islands (where it is indigenous, and breeds), from the Scilly Isles to Shetland; common and resident in Ireland. Temminck states that this species also lives in North America, but that the oyster-catcher of Brazil and the whole of South America forms a distinct race. He adds that it also inhabits Japan. The Prince of Canino, in his 'Birds of Europe and North America,' however, does not include it among the North American birds, but places opposite to it (in the American column) *Hæmatopus palliatus*, Temm. (*Hæm. Ostralegus*, Wils.; *H. Brasiliensis*, Licht.).

Food, Habits, &c.—Small crustaceans, &c., and bivalve mollusks, which last its powerful bill and frame well enable it to open, so as to get at the contents. It will frequently wade far out, and trust to swimming back for its return. Their four eggs, of a bright hue, inclining to olive or yellowish stone colour, spotted with ash-grey, or dark brown, or blackish, are deposited in a shallow hole, scratched in the gravel or sand, and sometimes among the shingles of the beach, but most frequently among the herbage of marshy places near the sea. It can hardly be said to make a nest. Time of incubation three weeks. Young when first hatched covered with down of a brownish grey colour. It is sometimes seen far up rivers and inland, where it feeds on earthworms, &c., and fresh-water insects and mollusks. Easily domesticated in poultry-yards. Several used to be kept upon the grass in front of the Pavilion at Brighton, and there are some now, in a half-tamed state, in the gardens of the Zoological Society in the Regent's Park.



Hæmatopus ostralegus.

SEA-SWALLOWS. [Terns.]

SEA-URCHINS. [Echinidæ.]

SEA-WEEDS are those plants which are found growing at the bottom of the sea. They form a large proportion of the numerous family Algæ [Algæ], and are all of them cryptogamic plants. Although many of the jointed and disjointed Algæ are found in sea-water, and might be called sea-weeds, we shall confine our remarks here to those forms of the jointless Algæ which comprehend the genus Fucus and its allies, and contain the most striking and useful forms of these plants.

The first section of this group of water-plants is the FUCOIDEÆ, which have for their type the genus *Fucus*. They are all of them marine plants, of an olive brown or greenish colour, and very fine in their texture. The cellular structure of which all the Algæ are composed is in these plants in a very condensed state, assuming a leathery and sometimes even a woody character. The base of their stem or stipes forms a dense shield-like root, whilst their upper part is often expanded into a broad foliaceous appendage. The reproductive organs consist of small black or very dark spores, which are collected into sori or are found scattered on various parts of the frond. These spores are enveloped in a thick gelatinous mucus, which seems to be a provision for the purpose of attaching them more securely to the rocks on which they grow in the midst of the restless element to which they are constantly exposed. They are of very rapid growth, and only a few months serves to cover a surface of naked rock with a forest of various species of Fuci. Kelp is manufactured from the species of plants belonging to this section of Algæ; the one most commonly collected for this purpose is the *Fucus vesiculosus*. Kelp is not now manufactured to any great extent in this country, but a few years since it was a source of great wealth in the Western Islands and the western shores of Scotland. [KELP.] At one time the quantity made in Scotland and its adjacent isles was not less than 20,000 tons annually, which sold at the average price of 10*l.* per ton.

Although, from the simple structure of the Algæ, we should not expect that they would elaborate many of those secretions which in higher plants are found subservient to the use of man and other animals as food, yet among many of these an albuminous matter is secreted, which is highly nutritious. In Gothland, the *F. vesiculosus* is given as provender to hogs, and hence is called swine-tang. Many other animals will also eat this plant as food, in times of scarcity. It is also collected in Jersey, and when dried is used as fuel. The fishermen both of our own and the Dutch coasts use this Fucus and the *F. serratus* for packing up their fish; the latter is however preferred, as, from containing less mucus, it is less likely to ferment. The Fuci were at one time used considerably in medicine, as well as other forms of Algæ, but since the discovery of their active principle, iodine [IODINE], they have been comparatively little used. According to Ecklon, the *Laminaria buccinalis* of the Cape of Good Hope is the sea-weed that produces the greatest quantity of iodine.

The *Largassurum vulgare*, or tropic grape, the *Fucus natans* of older writers, is remarkable for the immense quantities in which it occurs in certain portions of the ocean. It only grows within forty degrees of the equator, on each side, although occasionally thrown up by currents on our own shores. In some parts of the ocean it is so constant that it is said to assist pilots in rectifying their longitude. It was the occurrence of immense fields of these weeds that struck the sailors of Columbus with so much awe, and led them to suppose that Providence had determined to frustrate their course, which nearly terminated in the giving up of their great attempt to discover the New World.

The LICHINEÆ are a small group of these plants, which are interesting in a botanical point of view on account of their resemblance to the Lichens, or Liverworts, thus serving to connect the Algæ, which are the Lichens of the sea, with those which grow on the land. There is only one genus *Lichina*, of which there are two species, both British, the *L. pygmæa* and the *L. confinis*; they both grow on rocks which are never permanently submerged, and thus in habit as well as in structure they approach the liverworts.

The LAMINARIEÆ, or tangles, have a densely fibro cellular structure, and their spores are collected together in sori on the surface of the frond. These plants are coriaceous or membranaceous in structure, and are little changed by exposure to the air. Some of these are used. *Laminaria esculenta* is an edible species. It grows to the length of twenty feet, and the midrib, stripped of its membranaceous covering, is the part that is eaten. *L. saccharina*, or the sugar sea-belt, is said to be eaten by the Icelanders. In Japan it is also considered a great delicacy. *L. digitata*, or sea-wand, is eaten in Scotland, and is cried about the streets of Edinburgh as *tangle*. Many of the sea-weeds belonging to this and other genera have been found to make excellent manure for grass-lands. Kelp has in many instances been used, and it has perfectly succeeded. It has been tried as a top-dressing, and singly or in combination with other manures on corn, pasture, potatoes, turnips, &c. with the best effect.

The SPOROCHNOIDEÆ is a small group composed of the scatter-tuft (*Sporochnus*) and three other genera, which are remarkable for bearing little tufts of fine green filaments on the fronds. They are of an olive or yellowish green colour: they become flaccid on exposure to the air, acquiring a verdigris colour, and possess the property of decomposing other algæ with which they may come in contact.

The DICTYOLEÆ, or sea-networks, are a larger section than the last, and are characterised by the beautifully reticulated texture of the tegument. Their fronds are of various forms, but all of them are ribless. To this section belongs the *Chorda filum*, sea-whiplash, or sea-whipcord, which is often found thirty or forty feet in length. The frond of this plant is hollow within and interrupted at short distances, which appears to be for the purpose of enabling the plant to float in the water, and thus securing the same end as the more highly developed vesicles of *Fucus vesiculosus*.

The FLORIDEÆ are an extensive section, and include some curious and valuable species. They are distinguished by their brilliant and little-fading tints, their leaf-like fronds, and the collection of their spores into sori, or, if scattered, by the spores being arranged on a ternary plan. The *Chondrus crispus*, or Carrageen moss, belongs to this section. In Ireland it is used extensively as an article of food, and has lately been sold in London as a substitute for Iceland moss. It is frequently employed, instead of isinglass, for the manufacture of blanc-mange and jellies. It has a slight bitter flavour, which may be removed by steeping for some time previous to boiling.

A species of *Gelidium* is said to be the substance collected by the swallows and used in the construction of the edible nests of Java. Strange as it may seem that a taste for birds' nests should exist among any people, yet so strong is this taste in China, that the trade in birds' nests forms a very lucrative and extensive branch of commerce. Burnett, in his 'Outlines of Botany,' observes, 'It has been estimated that 242,400 lbs. of birds' nests, worth in China 234,290*l.* and upwards, are annually exported from the Indian Archipelago.' The only preparation the birds' nests undergo is that of simple drying, without direct exposure to the sun, after which they are packed in small boxes. They are assorted for the Chinese market into three kinds according to their qualities; and the common price for birds' nests of the first sort at Canton is no less than 3500 dollars the pecul, or 5*l.* 18*s.* 1½*d.* per lb.; for the second, 2800 Spanish dollars the pecul; and for the third, 1600.' The collecting these birds' nests, according to Mr. Crawford, is as perilous a toil as our fearful trade of gathering samphire; for he says, 'The nests are obtained in deep and damp caves, and are most esteemed if taken before the birds have laid their eggs. The coarsest are those collected after the young have been fledged. The finest nests are the whitest, that is, those taken before they are defiled by the young birds. They are taken twice a year, and if regularly collected, and no unusual injury offered to the caverns, the produce is very equal, and the harvest very little if at all improved by being left unmolested for a year or two. Some of the caverns are extremely difficult of access, and the nests can only be collected by persons accustomed from their youth to the office. In one place the caves are only to be approached by a perpendicular descent of many hundred feet by ladders of bamboo and rattan, over a sea rolling violently against the rocks. When the mouth of the cavern is attained, the perilous office of taking the nests must often be performed by torch-light, by penetrating into the recesses of the rock, where the slightest trip would be instantly fatal to the adventurers, who see nothing below them but the turbulent surf making its way into the chasms of the rock.' (Crawford's *Eastern Archipelago*.)

Several other species of Gelidium are made use of as food, more especially in the East, where they are added to dishes to render the hot and biting condiments more palatable.

The species of *Gracillaria* are also used as food, and one of them, *G. lichenoides*, is highly valued in Ceylon and other parts of the East, and bears a great resemblance to *G. compressa*, a species of the British coast, and which Dr. Greville says is little inferior to the first, and has been used in this country both as a pickle and a preserve. The *G. tenax*, the *Fucus tenax* of Turner, is invaluable to the Chinese as the basis of an excellent glue and varnish. 'Though a small plant,' says Dr. Greville, 'the quantity annually imported at Canton from the provinces of Fokein and Tchikiang is stated by Mr. Turner to be about 27,000 lbs. It is sold for sixpence or eight-pence per pound, and is used for the purposes to which we apply glue and gum arabic. The Chinese employ it chiefly in the manufacture of lanterns, to strengthen or varnish the paper, and sometimes to thicken or give a gloss to silks or gauze.' Mr. Neill thinks it probable that the gummy matter called chinchou, or hai-tsai, in China and Japan, may be composed of this substance. Windows made of slips of bamboo, and crossed diagonally, have frequently their interstices wholly filled with the transparent glue of hai-tsai.

A celebrated vermifuge on the Continent is prepared from the *Helminthocorton*, a genus which grows in the Mediterranean, and goes by the name of the coralline of Corsica. It has also been recommended as a remedy in cancer, but is seldom used in this country.

The *Plocamium*, or hair-flag, is one of the most elegant plants of this section. It was formerly used much in the construction of artificial landscapes on paper, and its collection and preparation gave employment to many of the poor on our coasts.

The THAUMASIEÆ consist of the curious genus *Thaumasia*. Agardh says, 'This genus is of so singular a nature, that it is difficult to say whether it should be arranged among the zoophytes or the algæ. It is an alga with a skeleton, the skeleton is that of a zoophyte, but the softer parts are those of a flag. The skeleton or frame-work consists of meshes formed of hard filaments about the size of a hog's bristle, rigid, fragile, and of a shining brown colour; internally they are solid, not tubular. The foliaceous substance with which the network is overspread is then flexible and blackish.' It has been found in the roads near Ceylon.

The GASTROCARPEÆ are known by their ribless veinless fronds, with a cellular tissue extremely hard and tough, but internally soft and gelatinous, the latter having the sori imbedded in it. The *Iridea edulis*, edible dulse, is a favourite food with many of the crustaceæ, as lobsters, crabs, &c.: it is also eaten by fishermen, both raw and roasted. It is said to resemble in flavour roasted oysters. The *Halymenia palmata* was at one time used as a masticatory, but its use has been supplanted by tobacco. It is still however used as a popular remedy in scorbutic and other cutaneous diseases. 'To the Icelanders it is a plant of considerable importance. They prepare it by washing it well in fresh water, and exposing it to dry, when it gives out a white powdery substance, which is sweet and palatable, and covers the whole plant; they then pack it in casks to keep it from the air, and thus preserve it ready to be eaten, either in this state with fish and butter, or, according to the practice of wealthier tables, boiled in milk, and mixed with a little flour of rye. The cattle are also very fond of this sea-weed, and sheep are said to seek it with such avidity as often to be lost, by going too far from the land at low-water.' (*Quart. Rev.*, vii. 68.) From this latter circumstance it was called *fucus ovinus*, or sheep dulse. In Kamtchatka it is used for making a fermented beverage, which is easily produced on account of the great quantity of sugar this plant contains.

The above sections of the family Algæ contain most of the sea-weeds: a few more are mentioned under Ulvaceæ [ULVACEÆ], which are not exclusively marine plants.

SEAFORD, a small seaport town, and a member attached to Hastings, one of the Cinque Ports [CINQUE PORTS], is situated between two ridges of the South Downs on the coast of Sussex, 61 miles almost due south from London. It was formerly the port where the river Ouse emptied itself into the sea, but the great storm of 12th Eliz. (1570), which diverted the channel of the Rother, made a fresh mouth for the Ouse by breaking through the beach just below Bishopstone, and forming what is now called the Old Harbour, which was used till a safer exit was made at Meeching, since called Newhaven. The present harbour of Newhaven is formed in the channel of the river Ouse, at its entrance into the sea, by wooden piers carried out in a southerly direction across the beach to the line of low-water. The river is navigable without locks two miles beyond the town of Lewes and with locks 10 miles farther up the stream, making 18 miles altogether, and affords a powerful backwater for scouring the entrance. The average rise of spring-tides at the harbour's mouth is from 19 to 20 feet, and of neap tides about 14 or 15 feet. The bar however is left dry at low-water of spring-tides, although within the piers there is at such times two feet water, and this depth continues uniform for a mile up the channel. The distance between the pier heads is only 106 feet. During the flood-tide and fine weather the harbour is easy of access, from the indraught and eddy tide, which set towards the mouth; but from the rapidity of the stream during the ebb it is not considered safe for a sailing vessel to enter. The harbour is managed by trustees acting under a local act of parliament. The town of Seaford was a Roman station; the remains of Roman villas have been discovered on the site, and an extensive Roman cemetery on Sutton farm. On the hill above the town to the east there was a large Roman camp, the outline of which may still be traced. Some antiquarians have considered this the site of the city called Anderida by Pancirollus, in his Notitia, and Andredes-ceaster by the Saxons, one of those fortresses established by the Romans in the south and eastern parts of the island towards the sea, for watching the approach of pirates and other enemies. According to the Saxon chronicle, every inhabitant was slain and the city wholly destroyed by Ella and Cissa in 490. The lordship formed part of the possessions of the Earls de Warren. The town, during the reigns of the Henries, was subject to those marauding visitations from the French so common on the southern coast; in one of these it was burned, and several religious edifices, not afterwards rebuilt, together with the original chancel of the church, were destroyed. Seaford is now little more than a large fishing village, with a few houses for persons who resort to this spot for bathing; but the sea, having greatly receded, has left a bar of beach nearly a mile in breadth. The town was incorporated in the 35th Henry VIII. (4th August), and is governed by a bailiff and an indefinite number of jurats and freemen, who hold an annual court of sessions and gaol delivery of unlimited jurisdiction: the style is, 'the bailiff, jurats, and commonalty of the town and port of Seaford in the county of Sussex.' The corporation was left untouched by the Act 5 & 6 William IV., c. 76. Seaford returned two members to parliament from 26th Edward III. to 21st Richard II.; it again sent two, 1 Edward IV., but ceased to elect till the right was restored after a resolution of the House of Commons, 16 Charles I. (1640), from which time it regularly returned two members till disfranchised by 2 William IV., c. 45. Seaford is within the diocese of Chichester. The church is in the decorated style of the thirteenth and fourteenth centuries. The living is a discharged vicarage, with that of Sutton annexed. The population in 1831 was 1098.

(Horsfield's *History of Sussex*, 4to., 1835; Cooper's *Parliamentary History of Sussex*, 4to., 1835; *Excursions in Sussex*, 8vo., 1832; *Burrell MSS.*; *Parliamentary Papers*, &c. &c.)

SEAFO'RTHIA, a genus of palms, indigenous to the eastern coast of tropical New Holland, and found also in the nearest Asiatic islands, named by Mr. Brown in honour of Francis, lord Seaforth, a patron of botany. The species are elegant in appearance, with pinnate fronds, the flowers polygamo monœcious, sessile on a branched spadix, with several incomplete spathes, the male flowers above, and with two supporting each female flower. The calyx and coral are trifid. The male flowers with numerous stamens, and the rudiment of a pistil. The female flowers without any rudiments of stamens, ovary one-celled. Style very short. Stigmas three, spreading. Berry, fibrous, small, oval, one-seeded. Albumen ruminated. Embryo basilary. The genus is described by Labillardière under the name of Ptychosperma.

SEALS, PHO'CIDÆ, a family of marine carnivorous mammiferous quadrupeds.

The *Amphibious Carnivore* of Cuvier form a perfectly natural group. Their feet are so short and enveloped in the skin, that they are not available for any purpose on land, except a kind of creeping; and indeed terrestrial progression is effected by means of a sort of shuffling, jumping motion, in which the spine and the muscles of the body are principally employed, though the extremities are used in getting or rather climbing out of the water upon a rock or other projecting body. The webbed intervals of the toes, which last are completely enveloped in membranes that leave a considerable power of expansion to the extremity, serve as excellent oars; and these *amphibia* therefore pass the greatest part of their life in the sea, coming on shore only to bask and sleep in the sun, and suckle their young ones. Cuvier remarks that their elongated body, their very moveable spine, provided with muscles which put it in action with powerful flexibility, their narrow pelvis, their close thick fur, all unite to make them good swimmers, and the details of their anatomy confirm the impression produced by their external form. (*Règne Animal.*)

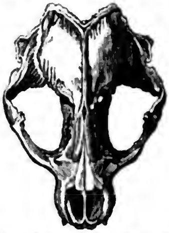
Two genera only, taking the term genus in its most comprehensive sense, belonging to this group, have as yet been discovered, the seals (*Phoca*, Linn.), and the walrus or morse (*Trichechus*, Linn.).

SEALS.

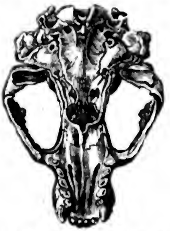
Organization.

Skeleton.—If the *skull* of the common seal (*Phoca vitulina*) be compared with that of an OTTER [vol. xvii., p. 64], a great resemblance will be found to exist between them in the shortness of the muzzle, the compression of the interorbital region (which is greater in the seal), the width and flatness of the *cranium*, and especially of the whole region of its base or under part, with the exception of the tympanic portions, which are large and convex. The orbit is very large, and the frontal bone does not complete it backwards by a postorbital apophysis, nor is it distinguished from the temporal bone, except by the convexity of the last-named portion of the skull. The temporal crests are but little marked, and the occipital crest is insensible. The frontal bone does not form in front that triangular enlargement, the traces of which are still to be found in the otter; but the postorbital apophysis of the zygomatic arch is very strongly marked, and the jugal and temporal bones equally contribute to form it. The intermaxillary bones terminate near the nasal, without reaching to them: their suture below traverses the palate opposite the canines, and even, in the middle, opposite to the first molars. The palatine bones do not pass in front of the last molar, but their posterior border is situated very far back: this posterior border of the nostrils is notched by a re-entering angle. The pterygoïd apophyses of the palatine bone run very far back, slipping over those of the sphenoïd, which are very early soldered to the body of the bone, and have a tubercle on their anterior border, at the point where they touch the edge of the posterior nostrils. The part of the palatine bone which is in the orbit is moderate, and so is the orbital wing of the sphenoïd; the temporal bone is small and narrow; the parietal bones are early soldered to the occipital. Cuvier could neither detect a lachrymal bone nor a lachrymal hole. The membranous space at the junction of the maxillary, the palatine, and the frontal bones is very large and placed very backward: this is the membrane that occupies the place of the lachrymal bone. The suborbital hole is large, but less than in the otter, and its canal is very short. The analogue of the spheno-palatine bone is very large. The round aperture (*foramen rotundum*) is confounded with the spheno-orbital slit. Cuvier could not detect any vidian canal except a hole within the anterior border of the pterygoïd apophysis of the sphenoïd bone. The oval hole (*foramen ovale*) is small. The carotid canal (*canalis caroticus*) is united to the jugular hole (*fossa jugalis*), and gives off a recurved canal lodged in the lower internal wall of the tympanic portion, and which opens at its internal and posterior surface. The jugular hole is very large, as well as the condyloïd and mastoïd *foramina*. Externally, the tympanic bone has a plaited depression, in the middle of which the *foramen mastoïdeum* is pierced. The cavity of the cranium is large, wide, and high; its front is very much flattened; the cribriform plate is moderate, not very full of holes, elevated, and not sunk in a canal, as in the dogs; the *crista galli* is very distinct; the anterior clinoïd apophyses are hardly elevated, and the optic region is very flat. The region of the *sella* is on a level with the lateral regions; the *ossa petrosa* within have no pointed crest, but the hollow of their upper part is very deep, and wider at the bottom than at the entrance. A space in the basilary region in front of the occipital aperture remains for a long time unossified. The bones of the cranium are thin, and there are no frontal sinuses.

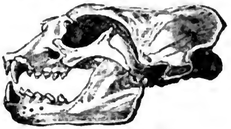
The skull of the Monk Seal (*Phoca Monachus*, Herm.) presents, independently of its size, some rather striking differences when compared with that of the *Phoca vitulina*. The zygomatic arches are more open and robust in the former; the anterior region of the frontal bone is convex; a very marked sagittal crest commences on the middle of the orbits and proceeds to join an occipital crest as strongly marked, which notches the back part of the cranium with a re-entering angle. There is also a notch at the posterior border of the palate, and the intermaxillary bones are very distinctly articulated to the nasal. On the anterior border of the orbit is a projecting point formed by the maxillary bone; and an obtuse longitudinal crest projects under the basilary region. In the upper jaw there are only four post-molars, the external ones being very slightly the largest; below there are four, also smaller; altogether five molars on each side of each jaw, less trenchant, and with lateral points much less marked than in *Phoca vitulina*.



Skull of Phoca Monachus, seen from above.



Skull of Phoca Monachus, seen from below.



Skull of Phoca Monachus (profile).

The shoulder-blade of the seal (Cuvier takes the last-named species as principal type) widens very much from before backwards; its antespinal fossa is much wider than the other; the anterior border is very convex, and the anterior angle is lost in this convexity. The posterior edge is slightly concave, and the posterior angle rather sharp. The spine projects but little, and is terminated by a small depressed acromion which does not advance so far as the edge of the articular surface. The acromial tuberosity is almost obsolete. In *Phoca vitulina* and *Phoca mitrata*, the antespinal fossa and the shoulder-blade altogether are much smaller, and there can hardly be said to be an anterior angle. In *Otaria*, on the contrary, the antespinal fossa is still wider in proportion than in *Phoca monachus*; it is divided longitudinally by a ridge less elevated than the spine and without an acromion. The humerus is remarkable for its relative brevity, and for the great projection of its internal tuberosity and of its deltoïd crest; its lower pulley is hollowed by an obtuse gorge, and divided into two parts—one external and wider, convex in two directions, for the head of the radius; one internal and narrower, for the cubit. Both the *Phoca vitulina* and the *Phoca mitrata* have the internal condyle pierced with a hole for the cubital artery, but this hole is wanting in *Phoca monachus* and *Otaria.* The upper head of the radius is rounded and has a simple concavity, is short and very much compressed, and dilated vertically for its lower two-thirds.

The *ulna* or cubit is very much compressed on its upper part, where the olecranon is much higher than it is long, and gives off a pointed apophysis towards the lower part. Its sigmoïd facet in *Phoca Monachus* is short and slightly concave in the longitudinal direction, and wider and convex in the transverse direction; the radial facet is below it, but in *Phoca vitulina* and *Phoca mitrata* the sigmoïd facet is longer and has the radial on its side. The *carpus* consists of a single bone for articulation with the radius, and one again sees in *Otaria* traces of the suture which, in early age, divided it into the scaphoïd and semilunar bones. The cuneiform bone gives attachment to the metacarpal bone of the little finger. The trapezial and trapezoïd bones are placed in *Phoca Monachus* nearly one above the other, so that it seems as if there were three rows of little bones to the radial border of the carpus, but in *Otaria* they have the ordinary position. The *os magnum*, which deserves its name in the human subject, is in the seal reduced almost to nothing; and the cuneiform bone is also very small. The hand of the seal, being principally destined for swimming, is cut obliquely, so that the thumb forms its point and its most powerful edge; it has nevertheless only two phalanges as in ordinary, but its metacarpal bone and its two phalanges make it longer and stouter than the other fingers. The articulations of the phalanges are not well marked. The ungueal phalanges of the seals have one remarkable conformation, namely, that the point which is sheathed in the claw comes out, in some degree, from the upper surface of the bone, and the rest of the bone forms, as it were, two little wings. In the *Otariæ*, which have no claws before, the ungueal phalanx is simply depressed and obtuse.

The *pelvis* of the seals, and especially the *ossa ilii*, are reduced to very small dimensions. These last are very small: their anterior border, in *Phoca vitulina* and *Phoca mitrata*, curves outwards and is truncated nearly squarely; in *Phoca Monachus* it is less reflected and more rounded; in *Otaria* it is less wide than it is long, and consequently of an oblong form, and nearly without any recurvature. The edge of this small pelvis is narrower, sharper backwards, and more parallel with the spine in *Phocæ vitulina* and *mitrata* than in *Phoca Monachus*. Their oval holes (*foramina thyroïdea* or *ovalia*) are also more elongated and narrower, and the posterior part either of the *pubis* or the *ischium* more dilated. It can be said that there is an ischiatic notch, for the ischium closely approaches the sacrum and tail, but without being united to them.

Of all the bones of the seals, the *femur* is the most extraordinary for its shortness; it is hardly longer than it is wide: in the lower part especially it is flattened and dilated laterally, having a crest at its internal border and a tuberosity on its external border. Its rotular pulley is flat and nearly vertical. The articular surfaces for the tibia are wider than they are long.

The *tibia* is twice and a half as long as the femur, and is rather stout, especially above, where, in age, it becomes soldered with the *fibula*, but always remains distinct from it below. The interval between them is rather wide. The fibula itself is rather stout.

The *astragalus* of the seals is very extraordinary; for instead of being more or less hollow in the middle of its articular surface, it offers to the leg a convex pulley formed of two faces, which together form a projecting angle like a roof, and one of which responds to the tibia, and the other (the largest) to the fibula. This bone has not only an apophysis forward for the scaphoïd bone, but has another backward, terminated by a tuberosity and forming a sort of internal heel, so that if looked at, separate from the rest, it might be taken for the os calcis. Upon this tuberosity of the astragalus the long flexor of the toes passes in a groove.

The true *os calcis* is placed on the external side of the astragalus, and does not carry its tuberosity farther backwards than that of the astragalus.

The *scaphoïd*, the *cuboïd*, and the three *cuneiform* bones have nothing very remarkable, but there is a small supernumerary bone at the internal border between the scaphoid and the great wedge-shaped bone.

The great and little toes are larger than they are long, and the middle toe is the shortest, so as to give the hind-foot a forked appearance; the great toe nevertheless has but two phalanges. All the articulations of these phalanges are as little developed as in the fore-feet.

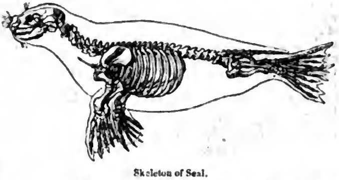
In *Phoca vitulina* and in *Otaria*, the ungueal phalanges terminate, as in the fore-feet of the former, in points furnished with small bony *alæ* at their base. In *Phoca Monachus*, which is without claws, they are, on the contrary, hollowed out into a small irregular fosset.

Cuvier remarks that what the seal loses of facility of motion on land, in consequence of the shortness of its limbs, is made up to it by the swimming power given by the mobility of the *spine:* all the vertebræ are distinct, very moveable upon each other, and furnished with very distant apophyses, which do not interfere with each other. There are 7 cervical, 15 dorsal, and 5 lumbar, 4 sacral and 12 caudal = 43; at least Cuvier found in all his skeletons the number given for the cervical, dorsal, and lumbar regions, and the number stated for the sacral and caudal regions in *Phoca Monachus;* and he adds that he has reason to believe that there would have been four sacral vertebræ in his other seals, if they had been adult, that he doubts whether *Otaria* has more than three, and that the tails consist generally of from ten to twelve vertebræ. The spinous processes are very much elevated in *Phoca Monachus*, moderate and more depressed (couchées) in *Otaria* and *Phoca vitulina*, and nearly effaced in *Phoca mitrata*.

The *ribs* are angular rather than flat, and slight when compared with those of the *Dugongs*. In the seals there are ten whose cartilages are attached immediately to the sternum, and nine only in *Otaria*. The ninth rib in the seals is attached to the side of the eighth bone of the sternum, and the tenth, as ordinarily, to the interval of the eighth and ninth: this last is cylindrical, longer than the others, and terminated by a cartilaginous dilatation. The others are depressed. In front of the first and last pairs of ribs there is in the seals a pointed cartilaginous prominence, which in *Otaria* is ossified, and makes part of the body with the first bone. (*Ossemens Fossiles.*)

In these *Pinnigrade Feræ* the whole form is adapted for progression in water. Instead of the lengthened anterior extremities and phalanges of the bats, framed to support a wing for their passage through the air, we have all the bones of those extremities in the seal short and compact, in order to support the finlike arm and deteriorated hand. We have the conical shape of the body and the extremely narrow pelvis, to favour that shape so as to produce the least resistance in passing through the water, with the short femur and posterior extremities directed backwards. In the skull we have the defective orbit observable in all the *Carnivora*, by which space is gained for the zygomatic arch and the highly developed temporal muscle. The broad development of the transverse processes of the atlas is here also remarkable, and the cervical vertebræ are framed for extensive motion. The spinous processes of the vertebræ have a posterior deflection so as to act in unison for the necessary aquatic progression. The clavicle is absent, as in the Feræ generally, but the scapula is broad. The number of carpal bones is the same as in the Lion, and the number of ribs may be stated at fifteen pairs.

Considerable differences exist, as we shall presently see, in the *crania* of the various *Phocidæ*, well justifying, with other discrepancies of structure, the division of the family into several genera.



Skeleton of Seal.

Organs of Digestion.—The stomach of the seal (*Phoca vitulina*) differs from the ordinary form: the œsophagus enters directly at the left extremity, so that there is no blind sac in the stomach. No. 534 A, in the Museum of the Royal College of Surgeons, exhibits the stomach of a seal (*Phoca vitulina*) injected, and its posterior parietes removed, to show the character of the internal surface, and the situation and form of the cardiac and pyloric orifices. Professor Owen, who made the preparation, observes that the circumstances most worthy of notice in this simple form of stomach are,—the absence of the *saccus cæcus* to the left of the cardiac orifice,—the large size of that orifice, —and the very small size of the pyloric aperture, which is further provided with a small valvular projection, in order to prevent more effectually the passage of undigested substances into the duodenum. The rugæ of the lining membrane are hardly perceptible in this specimen, and its vascularity appears to be slight, except at the pyloric end: this portion is acutely bent upon the cardiac. No. 697 is a portion of a small intestine, injected, of a seal (*Phoca vitulina*), showing the simple disposition of the mucous membrane, and the villi shorter and less numerous than in the Lion. No. 832 is the spleen of a seal, well injected by the veins, and showing that the injection is not confined in vessels, but in cells. The distended cells give a granular appearance to the whole external surface. No. 805 is a small portion of the liver of a seal minutely injected, apparently by the hepatic veins. (*Physiological Series*, Gallery. —*Cat.*, vol. i.)

Organs of Circulation and Respiration.—The seals have the power of opening or closing their nostrils at pleasure, and the interval between their respirations is very long. This may be observed in those which are kept in confinement; and the closing appears to be effected by sphincter-like muscles acting upon valvules which shut the aperture most effectually. Such a provision is absolutely necessary for animals that pass so much of their life in the water and take their food there: for ordinarily the seal eats in the sea, though it can eat upon land, as those who have seen the individual fed, which was lately exhibited in the gardens of the Zoological Society in the Regent's Park, well know. The breathing is not only slow, it is also irregular. After opening the nostrils and making a strong expiration, the animal inspires a large quantity of air, and closes the nostrils. In the intervals of this infrequent respiration, it is evident, from the free motion of the ribs and the general deportment of the animal, that the lungs receive their regular supply of air. In a state of nature a quarter of an hour and as much as twenty-five minutes have been known to elapse between their descent from the surface and their ascent thither for the purpose of obtaining a fresh supply; and in confinement they have been observed to remain asleep with the head under water for an hour at a time, and consequently without breathing during that period. To account for this power physiologists were of opinion that the *foramen ovale* remained unclosed in these animals, and that thus the sanguiferous circle was not interrupted during the time of their stay under water; but Cuvier and Lawrence found it closed in the seals dissected by them, and we must look to some other conformation for the endowment of this faculty. Thus Cuvier states that there is a great venous sinus in their liver, which assists them in their divings by rendering their respiration less dependent upon the circulation; and Mr. Houston has pointed out other venous reservoirs in the neighbouring parts. These provisions seem to be quite different from the great arterial plexus first pointed out by John Hunter in the WHALES; for in the seals the blood appears to be laid up not in a network of vessels, but, so to speak, in wide canals. The term *veineux* is certainly used by Cuvier, and a reservoir of arterial blood would, reasoning from analogy, be required for the purpose of keeping up healthy life during submersion; but there can be little or no doubt that these reservoirs are intimately connected with the power of remaining long beneath the water, though, as yet, the mode of operation is not satisfactorily made out, as it is in the Whales. The last-mentioned author states that their blood is very abundant and very black.

Brain, Nervous System, and Senses.—The brain of the Seals is well developed, and the degree of sagacity and attachment shown in domestication (for they are very easily tamed and taught to perform tricks) is evidence of superior intelligence. This has been long ago observed:—'Accipiunt disciplinam,' says Pliny (*Nat. Hist.*, ix. 13), 'voceque pariter et visu populum salutant, incondito fremitu: nomine vocati respondent.' M. F. Cuvier too saw one display much intelligence; he performed what he was ordered to do. When desired to raise himself erect on his hind-legs and to take a staff in his flippers, like a sentinel, he obeyed the word of command: he would lie down on his right side or on his left, according to order, and tumble head over heels when directed to do so. He gave a paw when requested, like a dog, and protruded his lips for a kiss. This animal appeared to be very fond of its master.

Sight.—Blumenbach remarks that it has long been known that the sclerotic coat in several mammals is, as in the human subject, not of equal strength throughout; but that its posterior part is much thicker than its anterior. It has also, he remarks, been conjectured that this structure might influence what are termed the internal changes of the eye, by which the form of the eyeball, and consequently the length of its axis and the relative situation of the lens are adjusted according to the proximity or distance of the object, or indeed with reference to any other relations. Blumenbach remarks that he flatters himself that he has ascertained the truth of this conjecture by discovering the admirable structure of this coat in warm-blooded animals which have not only the power of seeing at various distances, but also in two media of such different density as air and water. In the eye of the Greenland Seal, where he has noticed the fact, the cornea was thin and yielding; the anterior segment of the sclerotica, or that which is immediately behind the latter membrane, was thick and firm; its middle circle thin and flexible; and lastly, the posterior part very thick, almost cartilaginous. The whole eye-ball was surrounded with very strong muscles; and it may be easily understood how their action, modified according to circumstances, produces the requisite changes; how the axis of the eye is shortened when the animal sees in the air, by bringing the lens nearer to the back of the globe, in order to obviate the strong refraction which the rays of light undergo in passing from the thin medium of air into the thicker one of the eyes, and *vice versâ*. No. 1694, in *Mus. Coll. Chir.* (Gallery) exhibits the tunics of the eye of a seal (*Otaria*, Péron). The cornea and a longitudinal section of the sclerotica have been removed, showing the extensive tapetum, which is not limited to the under side of the upper part of the eye, as in those quadrupeds that move the upper eyelid principally, but is continued of nearly equal breadth all round the entrance of the optic nerve, a disposition which is in accordance with the uniform expansion of the aperture of the circular eyelid by which light is admitted into the eye in this tribe, and which is found associated with a similar form of eyelid in the cetaceans. On the part of the choroïd which is reflected from the cavity of the globe may be observed the broad ciliary zone, the large and deep ciliary processes, and the converging striæ of the uvea. The cut edge of the sclerotica shows the great thickness of its anterior and posterior parts, and the sudden thinness of the part which corresponds to the base of the ciliary zone. (*Cat.*, vol. iii.)

Hearing.—The auditory nerve in the seal is very large, and though the auricular aperture is closed by a mechanism somewhat similar to that which shuts the nostrils in order to protect the internal parts of the organ from the consequences of the great pressure of the water when the animal is in deeps, it is evident that seals hear very well even under water. Music, whether from the sounds of a or flute or violin, or even whistling, has been known to bring them to the surface of the sea near the performer, and to keep them there till the strain ceased, when they disappeared. In *Mus. Coll. Chir.*, No. 1611, is a section of the integument of the head of an eared seal (*Otaria*, Péron), showing the small pointed external ear. The size, shape and position of the concha are such as to present no impediment in swimming. The meatus auditorius is long and tortuous, and its parietes are supported by a series of long fibro-cartilages, which are moveably connected together. (*Cat.*, vol. iii.)

Taste.—That this sense is evidently well developed is shown by the keen relish of the seals for their food and the copious secretion of saliva secreted both in anticipation and during deglutition; and the structure of the tongue (which is notched or bifurcated at the tip) corroborates this evidence. No. 1508, in *Mus. Coll. Chir.*, is the tongue and larynx of a seal (*Phoca vitulina*), showing its bifid extremity fringed with delicate papillæ, its flattened upper surface, and the fossulate papillæ and rugæ at its base. The tonsillar ca ties and glands are indicated by black bristles. (*Catalogue*, vol. iii.)

Smell.—Acute. A Greenlander always tries to approach a seal against the wind.

Touch.—Well developed. The whiskers are very sensible: placed on each side of the mouth, and at the corner of the eye; they communicate with nerves of considerable size, and the slightest impression produces sensation.

Generative and Urinary Organs, &c.—There is nothing particularly worthy of notice in the male organs, excepting that there is a bone in the intromittent organ. No. 2794, A, *Mus. Coll. Chir.*, exhibits the female organs with the rectum, urinary bladder, and umbilicus of a young *Phoca vitulina.* The ovaries are enclosed in the peritoneal capsules; the one on the right side is opened, and the ovary bisected. The capsules are situated close to the ends of the *cornua uteri.* The inner surface of these tubes is beset with thick soft eminences, chiefly in the longitudinal direction, and which fall into longitudinal ridges as they approach the corpus uteri. This part is very short, but the cornua are externally united some way before they open into the common cavity. The uterus opens into the vagina on a well-developed round os tincæ. The vagina is separated, at the immature period of the subject from which the preparation was taken, by a well-marked constriction from the urethro-sexual canal. The urethra opens into the beginning of this canal upon a mamillary prominence. The clitoris projects from a small semilunar depression, just within the verge of the anterior part of the urethro-sexual canal. The rectum terminates close to the opposite side of the vulva, and a common cloacal sphincter-muscle embraces both apertures. (*Cat.*, vol. iv.)

Sir Everard Home (*Phil. Trans.*, 1824) states that in the placenta of the seal, the trunks of the vessels of which the *funis* is composed are not twisted upon each other; and that at about a third part of their length from the placenta, they divide into branches, which freely anastomose together, and are connected to the placenta itself by membranous folds, between which the blood-vessels are conveyed to its substance, on which they ramify with great minuteness; a structure that will obviously give greater facility to the circulation.

The *mammæ* are ventral, and are said to be two only in some of the *Phocidæ*, and four in others. The teats are concealed in the skin, so as not to suffer from crawling or rather shuffling on land, and some see in the bifid termination of the tongue an adaptation for enabling the young to seize the nipple under comparatively difficult circumstances.

No. 1263 in *Mus. Coll. Chir.* shows the kidney of a fœtal seal with the capsule removed to show the numerous small renules of which it is composed. (*Cat.*, vol. ii.)

Genera.

Calocephalus. (F. Cuv.)

Generic Character.—Molars formed principally of one great point placed in the middle, one smaller situated below, and two, also smaller, placed posteriorly. Cranium convex on the sides, flattened on the top: slight rugosities, instead of occipital cristæ.

Example, *Calocephalus vitulinus.*

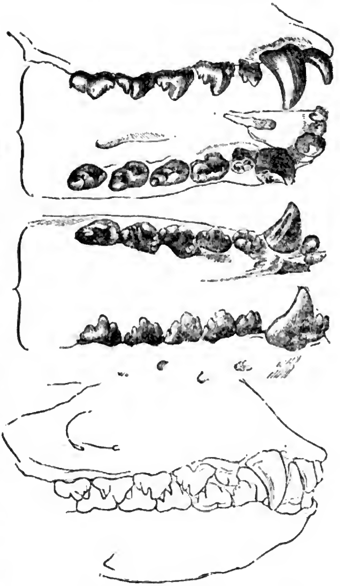
Description.—The ground-colour of the hair or skin, when the animal is alive and dry, is pale whitish grey with a very slight tinge of yellow; when just out of the water and wet, the ground-colour is ash; after death, and, as seen in museums, the ground-colour is pale yellowish grey, the oil having penetrated the skin, and rendered the hair of a more yellow hue. The body above is clouded and marbled with blackish grey. Space round the eyes and muzzle, sides of the body, all the lower parts and the feet, pale greyish; becoming nearly white beneath. There is some brown on the muzzle and upper part of the tail, whiskers moderate, undulated. Claws black and rather strong. Length from 3 to 5 feet.

This is the *Phoca vitulina* of Linnæus; *Le Veau Marin* and *Phoque Commun* of the French; *Vecchio marino* of the Italians; *Lobo marino* of the Spanish; *Meerwolf* and *Meerhund* of the Germans; *Zee-hund* of the Dutch; *Sæl-hund* of the Danes; *Sial* of the Swedes; *Common Seal* and *Sea calf* of the modern British; and *Moelrhon* of the antient British.

Geographical Distribution.—The northern seas generally. Coasts of England, France, &c. It is comparatively scarce on the southern coasts of Britain now, but still haunts the æstuaries of the Tees.

Dental formula:—

$$\text{Incisors } \frac{6}{4}\text{; canines } \frac{1-1}{1-1}\text{; molars } \frac{5-5}{5-5}\text{;} = 34.$$

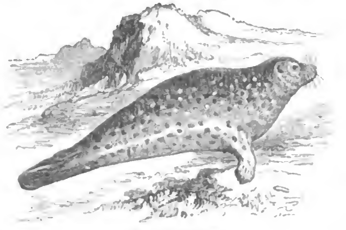


Teeth of Calocephalus.

Habits, &c.—Mr. Farrington, then of Dinas in Caernarvonshire, wrote thus to Pennant:—'The seals are natives of our coasts, and are found most frequently between Llyn in Caernarvonshire and the northern parts of Anglesey; they are seen often towards Carreg-y-Moelrhon, to the west of Bardsey, or Ynys Enlli, and the Skerries, commonly called in the British language Ynys-y-Moelrhoniad, or Seal Island. The Latin name of this amphibious animal is *Phoca;* the vulgar name is sea-calf, and on that account the male is called the bull, and the female the cow, but the Celtic appellative is *Moelrhon*, from the word *Moel*, bald, or without ears, and *Rhon*, a spear or lance. They are excellent swimmers and ready divers, and are very bold when in the sea, swimming carelessly enough about boats; their dens or lodgments are in hollow rocks or caverns near the sea, but out of the reach of the tide. In the summer they will come out of the water to bask or sleep in the sun, on the top of large stones or shivers of rocks, and that is the opportunity our countrymen take of shooting them; if they chance to escape, they hasten towards their proper element, flinging stones and dirt behind them as they scramble along, at the same time expressing their fears by piteous moans; but if they happen to be overtaken, they will make a vigorous defence with their feet and teeth till they are killed.'

Dr. Borlase, in a letter dated October, 1763, gives the following account:—'The seals are seen in the greatest plenty on the shores of Cornwall in the months of May, June, and July. They are of different sizes: some as large as a cow, and from that downwards to a small calf. They feed on most sorts of fish which they can master, and are seen searching for their prey near the shore where the whistling fish, wraws, and polacks resort. They are very swift in their proper depth of water, dive like a shot, and in a trice rise at fifty yards distance, so that weaker fishes cannot avoid their tyranny except in shallow water. A person of the parish of Sennan saw not long since a seal in pursuit of a mullet (that strong and swift fish); the seal turned it to and fro in deep water as a greyhound does a hare; the mullet at last found it had no way to escape, but by running into shoal water; the seal pursued, and the former, to get more surely out of danger, threw itself on its side, by which means it darted into shoaler water than it could have swum in with the depth of its paunch and fins, and so escaped. The seal brings her young about the beginning of autumn; our fishermen have seen two sucking their dam at the same time, as she stood in the sea in a perpendicular position. Their head in swimming is always above water, more so than that of a dog. They sleep on rocks surrounded by the sea, or on the less accessible parts of cliffs left dry by the ebb of the tide, and if disturbed by anything, take care to tumble over the rocks into the sea. They are extremely watchful, and never sleep long without moving, seldom longer than a minute; then raise their heads, and if they hear or see nothing more than ordinary, lie down again, and so on, raising their heads a little, and reclining them alternately in about a minute's time.'

The seal-hunters in Caithness assured Pennant that their growth is so sudden, that in nine tides from their birth they will become as active as their parents. On the coast of that county immense caverns open into the sea, and run some hundred yards beneath the land. These are the resort of seals in the breeding-time, where they remain till their young are old enough to go to sea, which is in about six or seven weeks. The first of these caves, says Pennant in continuation, is near the Ord, the last near Thrumster. Their entrance is so narrow as only to admit a boat: within they are spacious and lofty. Into the mouths of these caverns the seal-hunters enter about midnight in the month of October or the beginning of November, and having rowed up as far as they can, land. Each of them being provided with a bludgeon and properly stationed, they light their torches, and make a great noise. This brings down the seals from the recesses of the cavern in a confused body with fearful shrieks and cries. The men at first are obliged to give way for fear of being overborne, but when the first crowd is past, they kill as many as straggle behind, chiefly the young, by striking them on the nose. When the slaughter is over, they drag the seals to the boats. This is described as a most hazardous employment; for should their torches go out, or the wind blow hard from the sea during their continuance in the cave, their lives are lost.



Calocephalus vitulinus.

Utility to Man.—To the Greenlander the seal is all in all: it gives him light, food, and clothing. Mr. Farrington above quoted says of the Welsh seals, that they are taken for the sake of their skins, and for the oil their fat yields, 'the former,' says he, 'sell for four shillings, or four and sixpence a piece, which, when dressed, are very useful in covering trunks, making waistcoats, shot-pouches, and several other conveniences.' Pennant, speaking of the Caithness seals, states that those of six weeks old yield more oil than their emaciated dams; 'above eight gallons have been procured from a single whelp, which sells from sixpence to ninepence per gallon; the skins from sixpence to twelve-pence.' That the flesh was thought not unworthy of the tables of the great in this country is evident from the bill of fare at the 'intronazation' of George Nevell, the archbishop of York, to which we have often had occasion to allude; for we there find 'Porposes and seals 12:' and, indeed, Low, in his *Fauna Orcadensis*, states that at North Rolandsha they were taken for food, and that they made good hams. The numbers killed on the coast of Newfoundland in a good year amount to hundreds of thousands.

Calocephalus Grœnlandicus.

Description.—Hair drier, closer to the leather, and more free from wool than that of the other species; each hair and lustrous. A large brown oblique band, irregularly dentilated, commences nearly above the shoulders, where it joins that of the other side, and is carried along upon the sides and up to the hind legs, becoming by degrees brighter there and losing itself in the white of the belly: the posterior extremity approaches that of the other side at the root of the tail. Some small brown spots are scattered about both in the grey of the back and in the pale part of the band. The bands and spots become more and more black with age.

The *females* and the *young* have the skin of the same ground-colour, but without bands, and with unequal, well-defined, angular, brown spots, thrown, as it were, at hazard on different places of the upper and lower part of the body.

Cuvier, whose description this is, says that the ground colour of the *old male* is grey-white, and that he is five feet long. The face is entirely black.

According to Crantz, this species, when newly born, is quite white and woolly. In the first year it is cream-coloured; in the second, grey; in the third, painted with stripes; in the fourth, spotted; and in the fifth, wears the half-moons as the sign of its maturity.

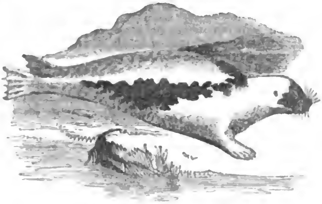
This is the *Phoca Grœnlandica* of Müller; *Phoca semilunaris* of Boddaert; *Phoca dorsata* of Pallas; *Phoque à croissant* of Buffon; *Harp-Seal* of Pennant and others; and *Attersoak* of Crantz.

Geographical Distribution.—The Frozen Ocean. Greenland, Newfoundland, Iceland, the White Sea, Kamtchatka. Rare in Britain.

Habits, Chace, &c.—According to Fabricius this species is very numerous in the deep bays and the mouths of the rivers in Greenland. They leave the coast twice a year: first in March, returning in May; again in June, and reappear in September. Their young, one, rarely two, at a birth, are brought forth in spring and are suckled on the ice far from shore. They avoid the fixed ice, but live and sleep in vast herds near the floating ice-islands, among which they are sometimes seen swimming in great numbers under the guidance of one who seems to act as leader and sentinel for the whole. Their food consists of all kinds of fish, shell-fish included, but they prefer the arctic salmon. When the feed, and one comes to the surface to breathe, he lifts his head only above the water, and quickly dives without changing his place. These seals swim in many attitudes, on their back, on their sides, as well as in the ordinary position, and occasionally whirl themselves about, as if in sport. They sleep frequently on the water, and are considered cautious, especially on the ice.

They are said to have a great dread of the toothed whales. If a grampus perceive a seal of any species basking on floating ice, it is asserted that he does his best to upset the or beat the seal off with his fins, when the latter becomes an easy prey.

Crantz avers that this is a careless stupid seal, and that it is the only one which the Greenlander will venture to attack alone. He goes to hunt it in his kajak, which is in the form of a weaver's shuttle. When he perceives a seal, he endeavours to surprise it unawares with the wind and sun in his back, that he may be neither heard nor seen. He approaches it rapidly but silently till within four or six fathoms. He then takes hold of the oar in his left hand, and with his right throws the harpoon. If it is fixed, the Greenlander throws the attached buoy overboard on the same side that the seal dives, and he dives upon the instant. The struck victim often carries the buoy under water, but wearied and wounded, it must at last come up to breathe. The Greenlander, who is on the watch, now attacks it with his long lance till the animal is exhausted, when he releases it from its sufferings with his short lance; and then, blows it up like a bladder that it may swim the easier after his kajak. This is a service of danger to the seal-hunter. If the line should be entangled, or if it should catch hold of the kajak, an oar, the hunter's hand, or his neck, as it sometimes does when the wind is high, or if the seal should make a sudden turn to the other side of the light boat, the kajak would be drawn under the waves. Then, unless the Greenlander has presence of mind and dexterity to disentangle himself, he is lost. Nor is this all the danger, for the dying seal may attack him; and if it be a female followed by young ones, she will not unfrequently turn on the pursuer, injure him, or bite a hole in his kajak and sink it.



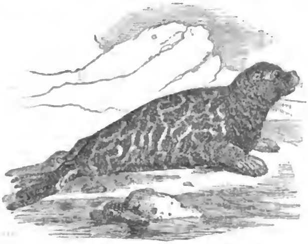
Calocephalus Groenlandicus (Male).

Calocephalus discolor, Marbled Seal.

Description.—Blackish-brown or deep grey marked with twisted and irregular lines of whitish-grey. Under parts lighter and the greyish lines broader and yellower. Sometimes the whitish-grey of the belly is more extensive, ascending to the sides. Size, similar to that of *Calocephalus vitulinus.*

Locality.—Coasts of France.

This was at first thought to be a variety of *Calocephalus vitulinus,* or one of that species exhibiting a modification of colouring from age or sex. Baron Cuvier observes that it does not appear to be a variety of the last-named species proceeding from age and sex only; but, he adds, that its cranium does not show a sensible variation from that of the common seal. Dr. Hamilton states that Professor Nilsson regards it as a distinct species, giving it the name of *Annellata.*

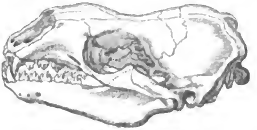


Calocephalus discolor.

M. F. Cuvier was for a long time acquainted with the individual on which he founded this species. It was young, and its size appeared to correspond with that of the common seal. It was captured on the coasts of France, and lived for several weeks in the Paris Managerie. M. F. Cuvier declares that he never knew any wild animal that was more easily tamed or attached itself more strongly. When it first came to the *Jardin des Plantes,* it did its best to escape, when M. F. Cuvier tried to touch it; but in a very few days its timidity vanished, and it rather courted his caresses than shunned them. In the same enclosure with it were two little dogs, and they amused themselves by mounting on the seal's back, barking, and even biting it: the seal however took it in good part, and seemed pleased with them, though it would sometimes give them slight blows with its paws, as if more to encourage their play than repress their liberties. When the little dogs made their way out of the enclosure, the seal tried to follow them, not deterred by the rough and stony ground. In cold weather they all three huddled kindly and warmly together. If the dogs snatched the fish from the seal's mouth when he was feeding, he bore it patiently: but he exhibited very different conduct to another seal, who shared his mess; for they generally had a fight over their meal, the combat ending, as usual, in the defeat of the weakest.

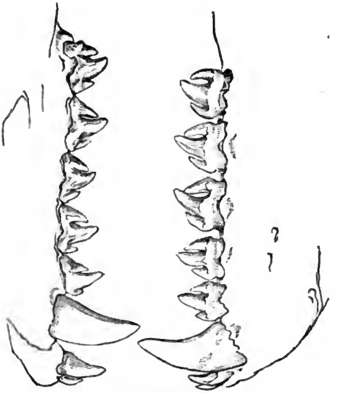
Stenorhynchus.

Generic Character.—Muzzle prominent; teeth composed of a long, median, rounded, cylindrical tubercle, curved backwards, and separated from two other tubercles which are rather smaller, one anterior and one posterior, by deep notches. Claws very small.



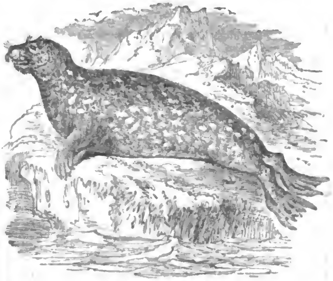
Skull of Stenorhynchus leptonyx.

Dental formula: incisors, $\frac{4}{4}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{5-5}$ $=32$



Teeth of Stenorhynchus.

Two species only of this genus appear to be known, namely, *Stenorhynchus leptonyx, Phoca leptonyx,* De Blainv., the *Small-nailed Seal;* and *Stenorhynchus Weddellii,* Less., *The Sea-Leopard.* Of the natural history of the first



Stenorhynchus leopardinus.

named species, which is a native of the Falkland Islands and New Georgia, little or nothing seems to be known; and the accounts of the latter, which we proceed to describe, are very meagre, though there is a very accurate description by Dr. Hamilton, in the 'Naturalist's Library' (*Mammalia*, vol. viii.). Professor Jamieson appears to have been the first who referred the species to F. Cuvier's genus *Stenorhynchus*.

Description.—Head small, no external ear. Hair soft, thin, and covering the whole of both extremities above and below, greyish above, yellowish below, the upper parts of the body spotted with whitish. Fore feet armed with sharp black claws, slightly curved and grooved, carinated beneath; no nails on the hinder extremities. Total length 9 feet 10 inches.

Locality.—South Shetlands, in 60° 37′ S. lat. (Weddell.)

This is the *Phoca leopardina* of Jamieson.

Pelagius. (F. Cuv.)

Generic Character.—Muzzle enlarged and elongated at its extremity; chanfrein very much arched; upper incisors notched transversely at their extremity; lower ones simple; molars thick and conical, having before and behind small rudimentary points only

Dental formula: incisors $\frac{4}{4}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{5-5}{5-5}$ $=32$.

Example, *Pelagius Monachus; Phoca Monachus*, Herm.; *Phoque à ventre blanc* of the French; *The Monk Seal.*

The skull of this species is given above, p. 158.

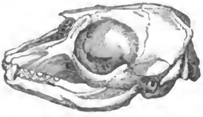
Description.—Hair short, smooth, and shining; dark-brown, mixed with grey on the neck and head, above; white below. No external ear. Whiskers smooth and strong. Length from 7 to 10 or 12 feet.

Locality.—The Adriatic; coasts of Sardinia.

This appears to be the *Phoca bicolor* of Shaw, and *Phoca leucogaster* of Péron. It is the species which afforded Buffon and M. F. Cuvier their interesting descriptions, and is supposed to be that whose skin was always carried everywhere (semper et ubique) by the emperor Augustus as a protection against lightning. (Suet., *Oct.*, 90.) The Romans generally seem to have considered seal-skins in the same light. Pliny, in his chapter headed 'Quæ non feriantur fulmine,' says, 'Ideo pavidi altiores specus tutissimos putant: aut tabernacula è pellibus belluarum, quas vitulos marinos appellant, quoniam hoc solum animal ex marinis non percutiat.' (*Hist. Nat.*, ii. 55.)

Stemmatopus. (F. Cuv.)

Generic Character.—Head surmounted by a peculiar organ (whence the name of the genus), the nature of which is not well known. Molars with simple roots, short and wide, and striated only on their crown; muzzle narrow and obtuse.

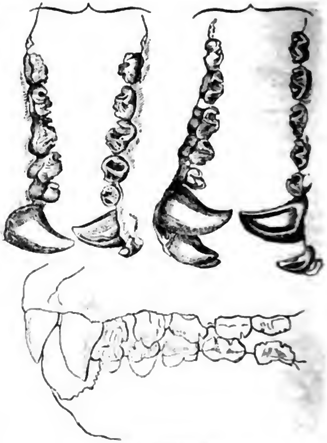


Skull of Stemmatopus.

Example, *Stemmatopus cristatus; Phoca cristata*, Gmel.; *Phoca leonina*, Fabr.

Description.—About two inches from the extremity of the upper jaw, on the superior surface, a cartilaginous crest rises, increasing rapidly in height as it passes backwards, about seven inches high at its posterior or vertical edge, which is separated into two planes by an intervening depression an inch deep. The superior edge is slightly convex, and the whole structure is an elongation of the septum of the nose, the true nostrils opening on each side of it by an oblong figure. This crest runs into the hood or sac-like appendage of the head. This hood is strongly muscular, with an aggregation of circular fibres round its external orifices, which are two, situated at the lower anterior part of the head. These probably served the purpose of sphincters, so as perfectly to close the sac. The length of the upper jaw beyond this crest is chiefly attributable to the intermaxillary bones, which are long and broad. The eye is very peculiar, perfectly spherical, with the nerve entering directly in the axis of the ball. The sclerotic or external covering is divided at its middle entirely round, its two edges being connected by an elastic membrane thickly covered by muscles. The posterior half is subdivided into four longitudinal segments, extending from its edge to within a quarter of an inch of the entrance of the optic nerve. This structure, by elongating the axis of vision, may enable the animal more clearly to discern distant objects, and also, by the reverse, to draw the eye deep within the socket during repose, especially as there are no moveable eyelids, but only the membrana nictitans; the lens is spherical; the iris is broad, and evidently muscular. (Ludke and King, Dekay. *Annals of New York Lyceum.*) Fur soft and long, woolly beneath; black in old individuals, silvery beneath; white and grey in young specimens, spotted irregularly with brown. The dilatable sac which crowns the head covered with short brown hair. Length seven to eight feet.

Dental formula:—incisors $\frac{4}{2}$; canines $\frac{1-1}{1-1}$; molars $\frac{5-5}{5-5}$ $= 30$.



Teeth of Stemmatopus.

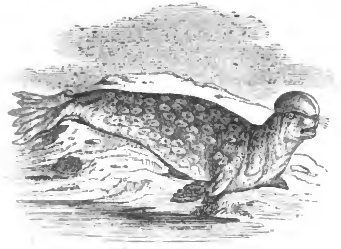
Locality.—The coast of Greenland, and of North America down to the United States.

Fabricius describes the crest to be a tuberculous body like an inflated bladder; keel shaped in the middle, covering the anterior part of the head, and so protecting the forehead, and confined to the males only; the females and young having it quite rudimentary, forming a slight projection on the part. In addition to the true nostrils, the male had spurious tuberculous ones, sometimes single, sometimes double, according to their age. The fishermen think that it is a reservoir for air when the animal is beneath the surface; and it has been suggested that the connection of the nostrils with this hood, its configuration, and internal structure, indicate its importance as ancillary to the sense of smelling; but it is confined, in anything like development, to the male, and perhaps is a mere distinguishing ornament, like the proboscis in the male elephant-seal.

Habits, &c.—This species, which especially haunts the open sea, is said to visit the land in April, May, and June chiefly. They are found for the most part on large ice-islands, where they sleep without precaution; and occur in great numbers in Davis's Straits, where they are stated to make two voyages a year, in September and March. They depart to bring forth their young, and return in June, very lean and exhausted. In July they proceed again to the north, where they appear to procure plenty of food, for they return in high condition in September. The crested seal is said to be polygamous, and to have its young on the ice.

Its bite is formidable, and its voice is stated to resemble the bark and whine of a dog. When surprised by the hunter, it weeps copiously. Among themselves they have fierce encounters, and inflict deep wounds in the conflicts with their claws and teeth.

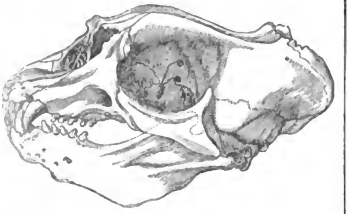
Utility to Man.—This is one of the species most generally pursued, and, together with the rough seal (*Calocephalus hispidus*), furnishes the greatest number of skins brought to Great Britain. The natives clothe their women with the skins of the young, and cover their boats and houses with the skins of the old ones. They head their hunting-spears with the teeth, and blow up the stomachs into fishing-buoys



Stemmatopus cristatus.

Macrorhinus. (F. Cuv.)

Generic Character.—Differing widely from that of the other seals. Incisor teeth curved like the canines, but smaller; canines strong and well developed; molars with simple roots, larger than the crowns, which last resemble a pedunculated mammilla.



Skull of Macrorhinus

Example, *Macrorhinus proboscideus.*

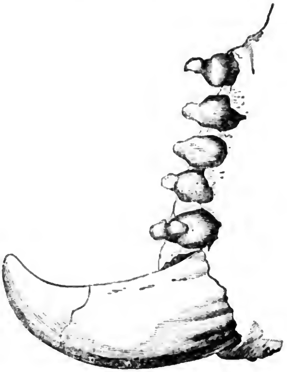
Description.—Male.—Nose prolonged into a kind of proboscis, which respires violently when the animal is excited, or is elongated in the form of a tube about a footlong, when it is preparing for attack and defence. When the animal is in a state of repose, the nostrils are shrunk, and the proboscis flaccid, giving the face a larger appearance. No external ears. Whiskers strong, coarse, long, and screw-twisted. Eyes very large and prominent. Swimming-paws very well developed, the nails very small. Hair short and close. Colour greyish or bluish-grey; rarely blackish-brown. Length from 20 to 30 feet. Girth from 15 to 18 feet.

Female.—No proboscis. Dark olive-brown above, shading away to a yellowish-bay upon the belly. Under part of the cheeks and chin approaching a full dark brown, and rather longer there than elsewhere. Hair lying in patches in all directions, giving a spotted appearance to the body, somewhat like watered silk. No nails on the hind toes. (Lizars.)

Geographical Distribution.—Southern hemisphere, both in the Atlantic and Southern Oceans, between 35° and 55° S. lat. Kerguelen's Land, South Georgia, Juan Fernandez, South Shetland, and the Falklands.

This is the *Phoque à trompe* of Péron; *Phoca proboscidea*, Desm.; *Elephant Marin* of the French; *Sea-Elephant* and *Elephant-Seal* of the English; *Bottle-Nose* of Pennant; *Miouroung* of the Australians.

Dental formula:—incisors $\frac{4}{2}$; canines $\frac{1-1}{1-1}$; molars $\frac{5-5}{5-5}$ = 30.



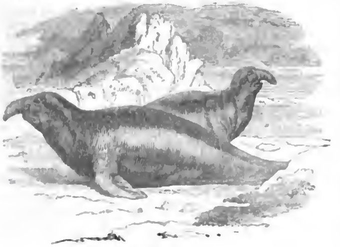
Teeth of Macrorhinus.

Habits, Food, &c.—This enormous animal, which, to use the expression of Mr. Lizars, 'compared with any ordinary seal three or four feet long, appears like an elephant when compared to a sheep,' owes its name to its size and bulk, most probably, quite as much as to the proboscis with which the male is furnished. These seals are fond of wallowing in fresh-water swamps, and resort to lakes and rivers, whose waters they drink with apparent pleasure. They sleep both afloat and on the sands of the shore: when a flock reposes in the latter situation, some of them keep watch, and, if alarmed, down they go to the sea. Those who have seen them in progress describe their gait as very singular, their motion being a kind of crawling, during which their body trembles like a great bag of jelly. At every 15 or 20 paces they halt, as if from fatigue. If any one gets before them, they stop, and if urged to motion by repeated blows, appear to suffer much, and the pupil of the eye, which is ordinarily bluish-green, becomes blood-red. Notwithstanding their unwieldiness however, they have been known to ascend low downs of 15 or 20 feet elevation, in order to reach small ponds of water. The cry of the female and the young is said to resemble the lowing of an ox, but the hoarse gurgling singular voice of the male, strengthened by the proboscis, is described as being audible to a great distance, and as wild and frightful. To obtain shelter from the heat of the sun, when lying on the shore by day, they cover themselves, by the aid of their paws, with the moist sand. They perform a sort of migration in order to avoid the extremes of heat and cold, leaving the south in the beginning of winter for more temperate climes, and retiring southward again in summer. About a month afterwards, the females bring forth one, very rarely two, according to Péron; generally two, according to Anson. The young weigh about 70lbs., and are between four and five feet long at their birth, the male, even at that early period, being larger than the female. At this time it is stated that the mothers are all collected near the shore, surrounded by the males, who prevent them from returning to sea till the period of suckling is past, during which operation the female lies on her side. The young grow so rapidly that they are said to double their original dimensions in eight days, and at the end of the third year they have attained a length of from 18 to 25 feet and upwards, when they increase principally in fatness. At this period the proboscis appears in the male. Six or seven weeks elapse before the young are conducted to sea, to familiarise them with which the whole troop abandon the shore, swimming about for three weeks or more, when they return to the coasts for the purpose of breeding.

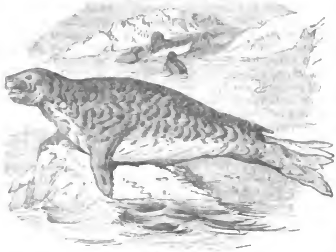
The young males stay with the females till their proboscis is developed, announcing that they have arrived at maturity. During the breeding season, bloody battles take place among the males, in which they are often severely wounded, but rarely killed, while the females calmly wait the issue, and receive the conqueror. The period of gestation is said to be nine or ten months.

They are a harmless race, never attacking man unless in defence of themselves and their young. One of Anson's sailors lost his life by exasperating a mother in whose presence he skinned her young one. Their disposition is however gentle and affectionate; and a young one, petted by an English seaman, became so attached to his master from kind treatment for a few months, that it would come to his call, allow him to mount upon its back, and put his hands into its mouth. Their length of life is estimated at 25 or 30 years.

Utility to Man.—The tongues of Sea-Elephants, when salted, are considered savoury and wholesome, but the flesh is black, oily, and indigestible. The heart, though tough and hard, is sometimes eaten, but the liver appears to be unwholesome. The skin, though not valued for its fur, is extensively used for carriage and horse harness, on account of its thickness and strength. But the oil is the great object for which the animal is hunted. It is clear, inodorous, and is said never to become rancid, nor to give out any disagreeable savour in cooking. It burns slowly, but, according to general report, produces neither smoke nor smell. The quantity afforded by a large individual amounts to 1400 or 1500 lbs., for the blubber is as thick as it is in many of the whales, often more than a foot. The blubber is prepared like that of whales, excepting that in the case of the seals the operation is performed on shore. It is employed in England chiefly in the manufacture of cloth; and is also used to a considerable extent in China.



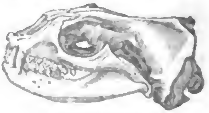
Elephant Seal Males.



Elephant Seal. Female.

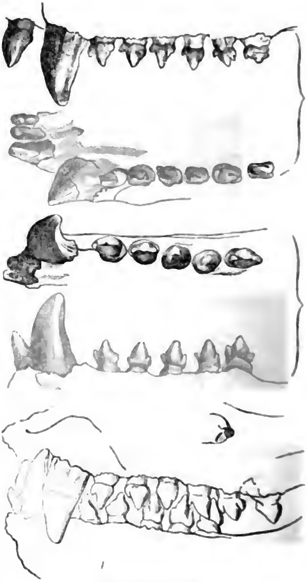
Arctocepalus. (F. Cuv.)

Generic Character.—Head with a narrow retracted muzzle. The four intermediate incisors of the upper jaw separated in their middle by a deep notch; the lower incisors notched from before backwards. Molars with a single root, less thick than the crown, which consists of a tubercle, furnished at its base before and behind with a smaller tubercle. External ears.



Skull of Arctocephalus.

Dental formula: — Incisors $\frac{6}{4}$; canines $\frac{1-1}{1-1}$; mola $\frac{6-6}{5-5} = 36$.



Teeth of Arctocephalus.

Example, *Arctocephalus ursinus.*

Description.—Size of a large bear; girth at the shou five feet, near the tail 20 inches. Fur brown, acquirin greyish tint at the point of the hairs in old age. Exte ears 1 inch 8 lines long, conical, erect, covered with hair, and opening by an oblong slit, which is shut the water. Nails very slender and minute. Length feet.

Geographical Distribution.—Islands on the north-point of America. Kamtchatka. The Kurile Islands.

This is the *Otaria ursina* of Desmarest; *Phoca* of Linnæus; *Ursus marinus, Sea Bear,* of Steller; *L'Ou Marin* of Buffon; the *Ursine Seal* of some authors.

Habits, &c. — When these migratory seals appear Kamtchatka and the Kuriles early in the spring, they in high condition, and the females are pregnant. They main on or about the shore for two months, during wh the females bring forth. They are polygamous, and live families, every male being surrounded by a crowd of fema (from 50 to 80), whom he guards with the greatest jealou These families, each, including the young, amounting

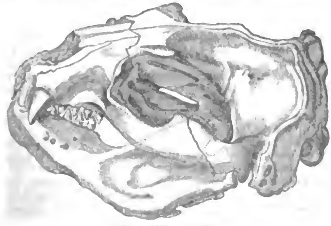
100 or 120, live separate, though they crowd the shore, and that to such an extent on the islands off the north-west point of America, that it is said they oblige the traveller to quit it and scale the neighbouring rocks. Both male and female are very affectionate to their young, and fierce in their defence; but the males are often tyranically cruel to the females, which are very submissive. If one family encroaches on the station of another, a general fight is the consequence. They will not, in fact they dare not, leave their stations, for if they did they must encroach on that of some other family. Steller relates that he had been beset by these seals for six hours together, and was at last obliged to climb a precipice to get rid of the infuriated animals, at the imminent peril of his life. They have their war-notes and several other intonations. When amusing themselves on the shore, they low like a cow, chirp like a cricket after a victory, and, when they are wounded, cry like a whelp. They swim very swiftly, and are as great a terror to other seals as the Sea-Lion is to them.

Utility to Man.—The skin, which is very thick, is covered with hair, like that of the common seal, but a great deal longer, standing erect, and very thick. There is a very soft brownish-red wool close to the skin. In the old males there is hair two inches long round the neck, erect and stiff, so that when the animal is dry, it looks larger than when it is in the water. The black hairs are tipped with white in the aged. The females are some ash-coloured, some partly ash-coloured and partly brown. The skins of the young are highly prized for clothing; and Steller speaks of a garment which he had made for himself from one, when he was in Behring's Island, with grateful remembrance.

Arctocephalus ursinus.

Platyrhynchus. (F. Cuv.)

Generic Character.—Incisors pointed; molars with no secondary point, except at their anterior part. Cerebral region very much elevated, and the muzzle much more enlarged than in *Arctocephalus*. The complete number of teeth the same as in that genus. External ears.



Skull of Platyrhynchus.

If a number of species have been confounded under the name of Sea Bear, there have been several honoured with the name of Sea Lions, and, among them, the Elephant Seal above noticed. M. Lesson enumerates three species of *Platyrhynchus*:—1, *Platyrhynchus leoninus* (*Otaria jubata*, Desm., the Sea Lion of Steller and Pernetty); 2, *Platyrhynchus molossinus*, Less. (*Otaria molossina* of the zoology of La Coquille. Less., and Garnot); and 3, *Platyrhynchus Uraniæ* (*Otarie Guérin* of Quoy and Gaimard). To the first of these he assigns the antarctic islands, such as the Falklands and Tierra del Fuego, adding that Steller found it in the northern hemisphere at the Kuriles; for the second and third the Falklands are the only locality given (*Manuel*.)

Dr. Hamilton also records three species:—1, *The Sea Lion of Steller* (*Phoca jubata*, Gmel.); 2, *the Sea Lion of Forster* (*Leo marinus*, Buff.); and 3, *the Sea Lion of Pernetty* (*Platyrhynchus leoninus* of F. Cuvier). To the first of these he assigns the eastern shores of Kamtchatka and the Kurile Islands and as far as Matsmai, adding that they abound in Behring's Island, and that Steller also saw them in abundance on the coasts of America in July; he assigns the southern hemisphere to the second, and the Falkland Islands to the third. We select as our example *the Sea Lion of Forster*.

Description.—Skin thick. Hair reddish, yellowish, or dark brown; no fur or short woolly hair under the long hair. A mane on the neck of the male reaching to the shoulders. Head small in proportion to the body, which is everywhere equally thick-looking, as Buffon describes it, like a great cylinder, more suited for rolling than walking. Ears conical, about 6 or 7 lines long, cartilage firm and stiff, but yet rather curled at the margin. Upper lip overhanging the lower, both furnished with long, coarse, black whiskers, which become white with age. Length from 10 to 14 feet; the females shorter and more slender.

Habits, &c.—Captain Cook states that it is not at all perilous to go among these animals, for they either fled or stood still. The only danger was in going between them and the sea; for if they took fright at anything, they would come down in such numbers, that the person in the way would be run over. When he and his party came suddenly upon them, or waked them out of their sleep, they would raise up their heads, snort and snarl, and look fierce, as if they meant to devour the intruder; but when the men advanced, the sea lions always ran away. He states that the male is surrounded by from twenty to thirty females, and that he is very attentive to keep them all to himself, beating off every male that attempts to come to his flock. Others, again, had a less number, some no more than one or two; and here and there was seen one lying growling in a retired place, suffering neither males nor females to come near him. These he judged to be old and superannuated.

Forster relates that the rocks along the shore in New Year's Harbour were covered with multitudes of these Sea Lions. 'We put into a little cove under the shelter of some rocks,' says he, 'and fired at some of these fierce animals, most of which immediately threw themselves into the sea. Some of the most unwieldy however kept their ground, and were killed by our bullets. The noise which all the animals of this kind made was various, and sometimes stunned our ears. The old males snort and roar like mad bulls or lions, the females bleat exactly like calves, and the young cubs like lambs. They live together in numerous herds. The oldest and fattest males lie apart, each having chosen a large rock to which none of the rest dare approach without engaging in furious combat.' Forster goes on to relate that they were often seen to seize each other with an indescribable degree of rage, and that many of them had deep gashes on their backs, which they had received in the wars. The younger active Sea Lions, with all the females and the cubs, lay together. They commonly waited the approach of the people; but as soon as some of the herd were killed, the rest precipitately fled, some females carrying off a cub in their mouths, while many were so terrified that they left the young behind. When undisturbed, they were often observed caressing each other in the most tender manner, and their snouts often met together as if they were kissing. The same author states that they come on shore on those uninhabited spots to breed, and that they do not feed during their stay on land, which sometimes lasts for several weeks; they then grow lean, and swallow a considerable quantity of stones to distend the stomach. He adds that the stomachs of many of them were found entirely empty, and those of others were filled with ten or twelve round heavy stones, each of the size of two fists.

Sea Lion of Forster.

Halichœrus. (Nilsson).

Generic Character.—Head very flat; muzzle very deep. Molar teeth of the upper jaw consisting of a simple point without tubercles: those of the lower jaw with a rudimentary tubercle before and behind the principal point. The number of incisors given in Mr. Bell's vignette (*British Quadrupeds*) is six in the upper jaw, and the same number apparently belong to the lower: canines $\frac{1-1}{1-1}$; molars $\frac{5-5}{5-5}$ $= 36$. No external ear.[*]

Example, *Halichœrus griseus.*

Description.—Coat white and silky, the hair two inches long, passing into a greyish lead-colour on the back. Wool under the hair short and white. Mr. Ball states that the very young females seem to be generally of a dull yellowish white, with rather long hair, which falls off in about a month or six weeks, and gives place to a shorter and more shining coat, variously blotched with blackish grey: this, he adds, is brighter at first, and gradually grows more dull, and the blotching more indistinct on the upper parts, as the animal advances in age; whilst on the breast and lower parts the blotches in some specimens show almost as distinctly as the spots on a leopard. From a peculiarity in the hair of the adult, which, Mr. Ball remarks, is considerably recurved, and as if its upper surface had been scraped with a sharp knife, this seal, when dry, and with its head turned towards the spectator, appears to be of a uniform silvery grey, whilst, viewed in the opposite direction, it appears altogether of a sooty brown colour; the spots or blotches being only visible on a side view. The only male specimen possessed by Mr. Ball died young: it had long yellowish hair, slightly tinged with brownish-black on the back, and was black on the muzzle, chin, and cheeks, extending round the eyes, but not to the upper part of the nose; the palms of the fore paws were black. Length from 7 to 8 feet.

Geographical Distribution.—Seas of the North of Europe, Baltic, coasts of Pomerania, south coast of Ireland.

This is the *Phoca Gryphus* of Fabricius; *Phoca barbata* of Fleming; and *Long-bodied Seal* of Parsons.

Habits, &c.—Professor Nilsson states that in the Baltic it is solitary; but Mr. Ball says that on the south coast of Ireland (Cork and Waterford) he has often seen this seal in small parties, and he learned from the fishermen that they had noticed as many as thirteen congregated on a rock. The same author has heard them in a cave baying like large dogs.

The comparatively small cerebral development and great expanse of the bones of the face, compared with that of the cranium, indicate a form inclining from the true Seals to the Walrus. All that is known of the habits of the Grey Seal tends to the conclusion that it is less susceptible of domestication and less intelligent than the other Seals.

FOSSIL SEALS.

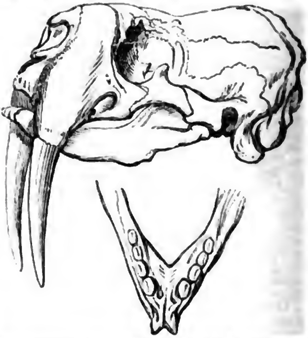
Cuvier, after adverting to the notices of so-called fossil bones of Seals from the caves of Franconia, Gailenreuth, &c., and the figures of the supposed remains of Sea Bears and Sea Lions published by Buffon, truly states that nothing is more rare than the fossil bones of Seals and Lamantins. No fossil remains of the Walrus, he observes, had ever been found when he wrote, and he had only been able to obtain well authenticated remains of Seals from the environs of Angers. These remains consisted of the upper part of a humerus and the lower part of a similar bone, but smaller. The first of these, in his opinion, belonged to a Seal once and a half larger than *Phoca vitulina*, and the other to a Seal rather smaller than that species.

Dr. Buckland, in his instructive plate 1 (*Bridgewater Treatise*), figures a Seal (Phoca) and a Walrus, indicating that their remains have been found in the tertiary strata (Pliocene period of Lyell). In the Fitzwilliam Museum at Cambridge is a portion of the jaw and two or three molar teeth of a large extinct species of Seal from the tertiary of Malta. This was Woodward's fossil, and was figured many years ago by Scilla.[*] In the tertiary of Suffolk, in which the remains of the monkey and the bat have also been discovered, the distal extremity of the femur of a Seal has been found.

WALRUS.

Organization.

Skeleton.—Though the general structure of the skeleton in the Walrus resembles that of the Seals, there is a striking difference in the cranium and the teeth. In the adult lower jaw there are neither incisors nor canines, and the lower jaw itself is compressed anteriorly so as to fit between the two enormous tusks (canines) of the upper jaw, which are sometimes two feet long and proportionably thick, and directed downwards. The great alveoli, or sockets for containing these formidable teeth, produce the characteristic form of the skull of the Walrus, and make the anterior part of the upper jaw present an immense convex muzzle, the nostrils having an upward direction, and not terminating at the snout. All the molars are cylindrical, short, and truncated obliquely. Between the two canines are two incisors similar to the molars, but Cuvier observes that the greater number of authors have not considered them as incisors, although they are implanted in the intermaxillary bone; and between them, besides, in young individuals, are two small and pointed teeth.



Skull and anterior portion of jaw of Walrus. Skull in profile. Anterior portion of lower jaw seen from above.

The stomach and the intestines are nearly the same as those of the Seals. (*Règne Animal.*)

Mr. MacGillivray found in the cranium of a young Walrus, in the Museum of the Royal College of Surgeons in Edinburgh, three incisors on each side of the upper jaw; the first or inner very small, the second a little larger, and the third or outer both disproportionately large, being equal to the largest molars. There were two very small incisors on each side in the lower jaw. The incisors are obliterated in adults.

There is a bone in the intromittent organ, and Nos. 1264 and 1265, *Mus. Coll. Chir.*, exhibit the kidneys of a fœtal Walrus, and the left kidney of a young Walrus injected, and the capsule removed to show its component renules (upwards of 400 in number). Their complete separation from each other is shown by the circumstance that where the artery in any of them has been obstructed, they remain uninjected, in consequence of the absence of anostomoses between their vessels and those of contiguous renules. (*Catalogue*, vol. ii.)

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[*] N.B. When it is stated in this article that any of the *Phocidæ* have no external ear, the sense intended to be conveyed is that they have a mere auditory aperture.

[*] 'De Corporibus Marinis Lapidescentibus quæ defossa reperiuntur,' &c.; 4to., Rom., 1747, pl. xii., fig. 1.

There is a general resemblance between the organization of the walrus and that of the seal; but the development of the brain is not so great in the former as it is in the latter, and the Walrus appears not to be gifted with so high a degree of intelligence as the Seal, though it is far from stupid.

Sir Everard Home (*Phil. Trans.*, 1824) pointed out some 'curious facts' in the anatomy of the Walrus and Seal, derived from the examination of specimens brought to this country by the Arctic expeditions then lately terminated. The results of his examination were: 1, That the hinder flipper or foot of the Walrus possesses a structure perfectly analogous to, or rather identical with, that of the apparatus by means of which the Fly supports itself in a perpendicular or dependent position. 2, That the duodenum of the Walrus does not receive the bile through a common duct formed by the union of those of the liver and gall-bladder; but that this latter organ, which lies behind the duodenum in the form of a large cylindrical hard body, receives the bile laterally by a single duct from the liver, and pours it immediately into the intestine by means of an opening projecting in the manner of the os tincæ. This structure differs from any that has hitherto been observed: the food with which the stomach was found filled consisted wholly of the *Fucus digitatus*.[*]

With regard to the first of these alleged facts, which has been repeated by good authorities and widely disseminated, it becomes necessary to state that, upon a careful examination of the flippers, no such structure appears to exist. Those who had the best opportunities of observing the animal alive and when recently killed, never detected it; and a letter from the late lamented Captain Lyon, R.N., is now before us, with drawings explanatory of the real state of the Walrus's hind flipper when closed, and of the specimen whose accidental distortion, by being pickled in a small cask, led Sir Everard astray.

Generic Character.—Head well proportioned, round, obtuse, eyes small and brilliant, upper lip remarkably thick, covered with pellucid whiskers or bristles as large as a straw. Two very large canines (in the upper jaw only) directed downwards. Nostrils large, rounded, placed on the upper part of the snout. No external ears.

In adults, according to Mr. MacGillivray, from whom the formula is taken, the incisors are obliterated, except the lateral pair of the upper jaw; the fifth grinder also disappears, and sometimes the fourth.

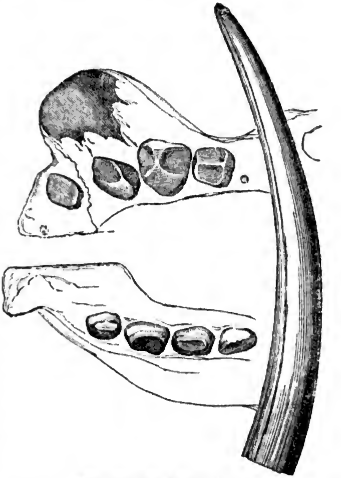
Example, *Trichechus Rosmarus.*

Description.—Neck short, body very bulky, broadest round the chest, and diminishing towards the very short tail. Hair close; colour, according to Fabricius, varying with age, the young being black, then becoming brown, and gradually paler and paler, till the animal in old age becomes white. Limbs very short. Inside of the flippers defended by a horny kind of coat, or callous, produced, in all probability, by climbing over ice and rocks. Length from 10 to 15 or even 20 feet in the case of the largest bulls. Girth 8 or 10 feet, and upwards. Length of the tusks when cut out of the skull generally from 15 to 20 inches, sometimes 30, and their weight from 5 to 10 lbs.

Geographical Distribution.—The Icy Sea and Northern Ocean, Spitzbergen, Nova Zembla, Hudson's Bay, Gulf of St. Lawrence, &c. Rare on the north coasts of Britain.

This is the *Walrus*, *Sea-Horse*, *Morse*, and *Sea-Cow* of the British; *Morse*, *Vache Marine*, *Cheval Marin*, and *Bête à la grande dent* of the French. It is the *Horse-Whale* or *Whale-Horse* (*Hval-ros*) of Oether the Norwegian, who, about the year 890, made his report of it to Alfred, as having in its teeth bones of great price and excellency, some of which he brought to the king on his return from his voyage beyond Norway; also *Rosmar* of the Norwegians; *Morss* or *Morsh* of the Russians; and *Morsh* of the Laplanders.

Dental formula:—incisors $\frac{6}{4}$; canines $\frac{1-1}{1-1}$; molars $\frac{5-5}{5-5}$ = 34.



Molars and Tusk of Walrus. (F. Cuv.)

Food, Habits, &c.—We have above seen that the contents of the stomach of a Walrus noticed by Sir E. Home consisted entirely of the *Fucus digitatus*, and Schreber affirms that it is not at all carnivorous. Fabricius and Crantz are of opinion that Walruses feed on shell fish and marine vegetables which adhere to the bottom of the sea, and that one of the uses of their tusks is to root up their food from the spot to which it is fixed. Buffon states that they live on fish, like the seals, especially on herrings and the smaller fishes. Mr. Scoresby found in their stomachs shrimps, a kind of crawfish, and the remains of young seals. Upon the whole of this evidence, the conclusion would be that the Walrus is omnivorous. The molar teeth certainly appear to be more adapted for bruising the 'long branches of sea-weeds, *Fucus digitatus*,' which Mr. Fisher informed Sir Everard filled the stomach of the animal that he examined, than for dividing fish or flesh; and the probability is, that though the Walrus does not abstain entirely from carnivorous habits, marine plants form the bulk of its food. The tusks must be a great help as ice-hooks or grapplings in assisting the animal to climb upon the ice from the sea. Though they swim so rapidly, that, according to some authorities, it is as difficult to follow them with boats in rowing, as the whale itself, their progress on land is awkward and tedious. Martens compares their gait to a kind of jerking, probably like that of the seals, but he says they can make considerable springs, and can advance pretty rapidly with the help of their teeth.

They appear to be monogamous, and consequently are exempt from the terrible combats which are the result of the jealousies of the polygamous seals. The female is said to bring forth her young, one only at a birth, either on shore or on the ice. When born the young is about the size of a year-old pig. Till taught by fatal experience the Walrus seems to be a fearless animal, and to be undisturbed by the face of man; but he soon learns his lesson of distrust. Still the animal is not incautious, for Captain Cook never found the whole herd asleep, some being always on the watch. These on the approach of the boat would rouse those next to them, and the alarm being thus gradually communicated, the whole herd would presently awake. In the North Pacific Ocean he got entangled with the edge of the ice, on which lay innumerable sea-horses. They were lying in herds of hundreds, huddling one over the other like swine, and were roaring and braying very loud; and indeed in the night or in foggy weather they gave the voyagers notice of the vicinity of the ice before it could be seen. They were seldom in a hurry to get away till after they had been once fired at, when they would tumble over each other into the sea in the utmost confusion. Vast numbers of them would follow the boats and come close up to them, but the flash in the pan of a musket sent them down instantly. Before they were put upon their guard by persecution, as many as 300 or 400 were killed at a time. That they are not without courage or sympathy for their wounded companions there is ample testimony. When Martens wounded one, others speedily surrounded the boat, and whilst some endeavoured to pierce it with their tusks, others raised themselves out of the water and endeavoured to board her. Captain Phipps, afterwards Lord Mulgrave, relates that when near a low flat island opposite Waygat's Straits, in 1773, two of the officers went in a boat in pursuit of Sea-horses. They fired at one and wounded it. The animal was alone when it was wounded, but diving into the sea it brought back a number of others. They made a united attack upon the boat, wrested an oar from one of the men, and were with difficulty prevented from staving or oversetting her; but a boat from the Carcass joining that from the Racehorse, they dispersed. Captain Phipps adds that one of that ship's boats had before been attacked in the same manner off Moffen Island. Sir Edward Parry encountered about 200 in Fox's Channel, lying piled as usual over each other on the loose drift-ice. A boat's crew from both the Fury and Hecla went to attack them, but they made a desperate resistance, some with their cubs mounted on their backs, and one of them tore the planks of a boat in two or three places. Their parental affection is great. The boats from the Resolution and Discovery were hoisted out to attack sea-horses in Behring's Straits. Captain Cook states that on the approach of the boats to the ice all the Walruses took their cubs under their fins, and endeavoured to escape with them into the sea. Several whose young were killed and wounded, and were left floating on the surface, rose again and carried them down, sometimes just as the people were going to take them into the boat; and they might be traced bearing them to a great distance through the water, which was coloured with their blood. They were afterwards observed bringing them up at times above the surface, as if for air, and again diving under it with a dreadful bellowing. The female in particular whose young had been destroyed and taken into the boat, became so enraged that she attacked the cutter and struck her tusks through the bottom of it.

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[*] See post, p. 170.

That the Walrus is capable of a degree of domestication, in youth at least, appears from the testimony published by John de Laet,* who gives no bad wood-cut of a full-grown animal and a young one, and relates that 'Ælius Everhardus Vorstius, M.D. et Professor,' saw a cub ten weeks old, according to those who had brought it from Nova Zembla, about the size of a mastiff (canis Britannici majoris), which followed its master (magno nisu et grunnitu) for its food, consisting of a mash of oatmeal or millet (pulmentarium ex avena miliove), which it ate slowly, et suctu magis quam deglutiendo. The tusks had not yet projected from the mouth, but tubercles were perceived in the upper lip. There were two heads of adults, and those who showed them said that with the tusks they ascended rocks and suspended themselves from them, and that their food consisted of the long and great leaves of some plant growing from the bottom of the sea. 'Vidi ibidem,' adds Vorstius, 'penem ejusdem animalis osseum, rotundum, cubitum et amplius longum, crassum, ponderosum, ac solidum, in fine prope glandem longe crassiorem ac rotundiorem. Hujus pulvere ad calculum pellendum Muscovitæ utuntur.'

Utility to Man.—The flesh is highly valued by the inhabitants of the Arctic regions, nor does it seem to have come amiss to our northern voyagers. Cook, after stating that he procured some, being in want of fresh provision, observes that till then they had thought them Sea-cows (Manatus probably), so that they were not a little disappointed, especially some of the seamen, who, from the rarity of the thing, had been feasting their eyes for some days. Nor would they, continues Cook, have been disappointed now, nor known the difference, if they had not had some on board who had been in Greenland, and declared what animals these were, and that no one ate them. Notwithstanding this however, Cook and his crew lived upon them as long as they lasted, and there were few on board who did not prefer them to salt meat. Sir Edward Parry remarks that the flesh was found tolerably good, affording a variety amid the ordinary sea-fare. But the tusks, the skin, and the oil are the parts and products for which the Walrus is more particularly hunted. The ivory of the first is highly esteemed, and is used in Europe for artificial teeth. The skins make excellent carriage-braces, and are very useful about shipping, making very good wheel-ropes, &c. The oil is more valued than that of the whale, though not more than twenty or thirty gallons are afforded by one animal.

Walrus. (Bell.)

FOSSIL WALRUS. See above, p. 168.

We here conclude this sketch of the *Phocidæ*, a family still requiring much elucidation. It is not at all improbable that some of the stories of Mermen and Mermaids have taken their origin from those who have seen Seals and Walruses with their heads lifted out of the water. The latter especially, in such a situation, bear a strong resemblance to the human head before their tusks have grown, and when seen at some distance. Mr. Scoresby notices a remarkable instance of this; the surgeon of the ship having actually taken one of them for a man, and having so reported it to his captain.

SEAS, PHYSICAL CHANGES OF. The relations of sea and land in respect of area, height and depth, interchange of moisture, aerial currents, and many other circumstances which influence mechanical, chemical, and vital phenomena on our globe, are so important, and, within the compass of the few hundreds or thousands of years which belong to history or tradition, appear to have suffered so little change, that nothing short of the complete proof furnished by geology ought to satisfy our minds that every one of the conditions which make up the now harmonious mutual dependence of land and sea is variable, that the present aspect of the globe is but one term of a long series of successive transformations, the law of which—the great problem of geology—is perhaps not beyond the reach of observation and induction.

Are the relative areas of sea and land constant? To this geology replies, that what is now land was formerly the sea; that in some of the parts which are now covered by water land antiently existed, so as to pour down rivers, conveying sediments of different sorts through valleys and plains clothed with various vegetation. The land which we behold is the bed of the antient sea; or, to speak more precisely, it is composed of the dried indurated sediments and the cooled volcanic products which, during long intervals of time, were accumulated beneath the ocean. Whether, during the process by which the antient sea-bed was raised to constitute our now dry land, a proportionate area of what was formerly land was depressed to constitute the modern sea-bed, is an unsettled question; but it is clearly proved that if any proportion of areas between sea and land is a necessary condition of our globe, all the parts of these areas are displaceable and have been displaced.

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* 'Novus Orbis,' 1633, lib. ii.

Is the relative level of the land and sea constant? We cannot affirm it. We cannot deny the existence of causes which may change generally and continually this relation, any more than the operation of agencies which locally and at intervals are known to derange it. If there be a general change of temperature in the earth itself, or communicated from the planetary spaces around it, or occasioned by any condition affecting the radiation of heat in the atmosphere above it; the unequal influence of this change on the unequally expanding and contracting liquid and solid masses will necessarily occasion variations in the relative level of sea and land. Now geology appears to have established many facts regarding the fossil organic remains of plants and animals, which admit of no clear general explanation except by supposing extensive, perhaps general changes of climate. There is nothing positively known which forbids the belief that such changes may be still really, however slowly, in progress; there is abundant proof of innumerable local derangements of the level of land and sea in comparatively modern geological, historical, and even very recent periods, and it is perhaps generally allowed that a slow upward movement of land is actually traceable and measurable on the coast of Sweden and Norway.

A change of a few degrees of temperature, a change of the relative height of the land, a change even in the polar distance of the masses of land, would materially affect many secondary phenomena. The atmosphere would be affected in regard to its moisture, translucency, rate of diminishing temperature, prevalent winds, and quantity of rain. Its power of sustaining particular organic structures both on the land and in the sea would be altered; and thus we see in the variable nature of the relations which unite the land and the sea, elements of continual change in the mechanical, chemical, and vital phenomena of the globe.

What is the actual mean level of the sea? By the researches of Captain Denham at Liverpool, by the careful measurements taken by Mr. Bunt in the Bristol Channel, under the direction of Professor Whewell, and by some unpublished experiments of Mr. De la Beche on the coasts of Pembrokeshire, it appears that the mean of high and low water is nearly at the same point, whether spring or neap tides be measured. This mean or half-tide level, which is often nearly coincident with the middle point of time between high and low water, can be ascertained by a few observations at any age of the moon in quiet weather, and should always be employed as the datum or zero line in recording elevations of mountains, heights of canals, summits, railway stations, &c. Above all it should be taken for the term of comparison whenever it is wished to determine the relative elevation of different parts of the open sea, though there may be cases when landlocked waters and tide rivers may require the use of another line of reference. The horizontal line which bounds the land and sea, the outline of the coast, is variable; it is annually displaced by the wasting of some tracts and the augmentation of others. Since the Roman sway in Britain a large portion of the rich marsh-lands of Norfolk, Cambridge, Huntingdon, &c. have been recovered from the retiring sea; but in the same period the east coast of Yorkshire has lost many square miles of territory, and is still losing at a fearful rate. (Mr. Lyell has collected abundant examples in his 'Principles of Geology.')

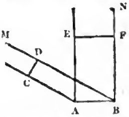
This unequal action depends partly on the *slope* with which the land and sea meet; partly on the nature of the materials comprising the coast; partly on the *set* of the tides and currents. When Dr. William Smith, the geologist, stopped out the sea from the enormous breaches which it had made on the coast north of Yarmouth, he employed the principle of a *moderate slope*, and instead of clay, fascines, &c., simply used the sand and pebbles, trusting with these yielding materials, at a gentle inclination, to imitate the process of nature, and gradually to weaken and destroy the dangerous power which high cliffs and solid constructions had no power to resist.

The modern ocean is the theatre of many operations similar in kind to those by which the materials of dry land were formerly accumulated beneath antient seas. The bed of the Adriatic was found by Donati to resemble the surfaces of sub-Apennine tertiary strata: the shallow soundings of the English Channel and German Ocean show, in the distribution of shells and fish-teeth, analogies with several of the secondary rocks; while in the coral reefs of warm latitudes, on sandy or pebbly shores generally, and at the mouths of great rivers, we see the production of limestone, sandstone, and clay deposits, very similar to those which abound in the stratified masses of land. Whoever will compare with attention the ripple or current mark on the seashore with the corresponding undulations on slates and sandstones of every geological age, will be convinced of the identity of the causes of these impressions; and when he beholds such surfaces in rocks covered by other deposits thousands of feet thick, will not hesitate to admit in such cases that great depressions happened along the margin of the antient sea during the formation of these strata, followed by still greater elevations at a later period.

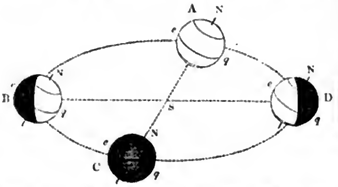
The distribution of life in the modern ocean is one of the circumstances most important to know, and yet is not so perfectly nor so extensively investigated as it deserves. Probably to each different sort of sediment on the sea-bed, and to each different depth below the surface, as well as to every degree of shelter or exposure, and every degree of temperature, belong specific influences on animal and vegetable life. Below some moderate depth (moderate at least as compared with the thicknesses of the strata) life ceases in the ocean from deficient light and air, and augmented pressure; to a few hundreds of feet perhaps some particular forms may reach; but corals which form reefs cease to live at one hundred feet, and the abundance of other orders of zoophyta, of mollusca, and crustacea, within a few feet from the surface, appears to justify the belief that the deep bottoms of the dark sea, like excessive heights in the cold air, and the centres of dry deserts, are nearly devoid of life.

(See a valuable table of depths at which mollusca have been found living, in De la Beche's 'Geological Researches.')

SEASONS, CHANGE OF. The phenomena of the seasons may be divided into those which always recur every year and those which are different in different years. We have in every year the same succession of longer and shorter days, with a summer and winter; while the summer of one year is of a higher temperature, and accompanied by finer days, than that of another. The unvarying phenomena can be explained by what we know of the sun's (or earth's) motion; the varying phenomena belong to the science of meteorology, and depend upon atmospheric and other circumstances, with which we have little or no acquaintance. At any given moment, the light and heat received from the sun, at any given place, depend upon the altitude of that body in two ways. In the first place, the lower the sun is, the greater the thickness of the portion of the atmosphere which its rays have to traverse before reaching the spot; the greater then is the light and heat which is lost in the passage. In the second place, the less the altitude of the sun, the less the actual quantity of light and heat which falls upon any given spot. If AB be the diameter of a circular portion of the earth's surface, and if the sun be seen in the direction BM, the light which falls on that circle is a cylinder of rays with the diameter CD; but if the sun be seen vertically, or in the direction BN, the cylinder of rays has EF for its diameter, besides which, the rays of the first cylinder are weaker than those of the second, as having passed through more of the atmosphere. Neglecting this latter consideration, the quantities of light and heat received when the sun is at two different altitudes are as the sines of those altitudes. Thus the sine of 30° being $\frac{1}{2}$ and that of 90° being 1, the quantity of light which falls on a given spot when the sun is vertical is double of that which falls when its altitude is 30°.



The earth's axis preserves its direction throughout the whole of the yearly motion. The consequence is, that places which are distant from the equator have very unequal days at different times of the year. [SUN.] The accompanying figure, which is generally given in connection with this subject, represents the earth in its four principal positions: the sun being at S, and N being the north pole of the earth, A is at the vernal equinox, the intersection of the equator and ecliptic passes through the sun, and days and nights are equal all over the world. B is at the summer solstice, where the sun is most above the equator on the northern side; the diurnal circles north of the equator have more day than night, and have their longest days: and *vice versâ.* C is at the autumnal equinox, the phenomena of A being repeated. D is at the winter solstice, where the sun is farthest from the equator on the southern side; the phenomena of B are now reversed, the days being shortest on the north side of the equator. This figure very well explains the variation of days and the main reason for the phenomena of seasons in the extra-tropical parts of the earth. It is evident that, speaking of the northern hemisphere, the sun, being above the equator, gives not only longer days, but greater altitudes; more powerful light and heat, and more of it in duration.



The average temperature being nearly the same in different years, the northern side of the earth must be receiving more than it parts with during a portion of the year, and parting with more than it receives during the remainder. The summer half of its year is that half during which it gains, on the whole, more than it parts with; the surplus being that which is lost during the winter half. The day in which most heat is received is the longest day; but it is notorious that the hottest weather is generally some time after the longest day. This is easily explained, as follows:—The time of greatest heat is not that at which most heat is received, but that at which the quantity of heat is the greatest, namely, just before the daily receipts of heat begin to fall short of the daily expenditures. As long as the receipt exceeds the expenditure, heat is daily added to the hemisphere, and the weather becomes hotter. The same reason may be given for the greatest cold generally following the shortest day, with a considerable interval. All these circumstances however depend much on the atmospheric circumstances of the year.

The preceding explanation does not serve for the tropical climates; the days and nights are here so nearly equal throughout the year, that seasons are caused more by the effect of the winds (which are very regular, and depend mainly on the sun's position) than by the direct action of the sun's light and heat. The seasons are not a summer and a winter, so much as recurrences of wet and dry periods, two in each year.

With regard to the quantity of heat received in a day, it might be expressed, so far as it is not modified by the atmosphere, in a formula depending on the latitude of the place and the sun's declination. It will be enough to say that this formula shows that, the sun being in the equator, the day's heat in different places is as the cosine of the latitude; and that for all places at the equator, the day's heat for different days is as the cosine of the sun's declination.

The different distances at which the earth is from the sun, at different times of the year, do not affect the heat received in a given portion of the orbit. The sun is nearest to the earth in our mid-winter, but for that reason the winter is shorter, since the earth moves more rapidly when nearer to the sun. The compensation is exact, for the quantity of heat received at any one moment, while the radius of the earth's orbit moves through any small angle, is greater or less in the inverse proportion of the square of that radius. But the time of describing that angle is less or greater in the direct proportion of the same square. Consequently the heat actually received by the earth in the two halves of its orbit is the same in both.

SEAT in a Church. [Pew.]

SEAWORTHINESS. [Ship.]

SEBA, ALBERT, a native of East Friesland, was born on the 2nd of May, 1665. He at first followed the occupation of a druggist at Amsterdam; but afterwards, entering the service of the Dutch East India Company, acquired great wealth. His early studies had given him a taste for natural history, and he spent his large fortune in forming a collection of the most interesting objects in the animal, vegetable, and mineral kingdoms. In 1716 Peter the Great purchased his museum, and removed it to St. Petersburg; but Seba immediately set about forming another collection, which soon surpassed every other in Europe. This was unfortunately dispersed after his death, which took place on May 3, 1736.

Seba wrote several papers on scientific subjects; but his great work was a description of his museum, published in Latin and French, in four volumes, folio, between the years 1734 and 1765. The first volume only was published during Seba's lifetime; the last three were edited by different persons after his death. The work is noted for the beauty and accuracy of its engravings, which caused it for many years to be regarded as the standard authority on subjects connected with natural history. The bad arrangement of the subjects however, and the inaccuracy of the descriptions, which resulted from Seba's want of scientific knowledge, greatly diminish its value. There is a notice of Seba in the 'Dictionnaire des Sciences Médicales, Biographie Médicale,' tome vii., article 'Seba.'

SEBACEOUS GLANDS. [Hair.]

SEBACIC ACID. This acid is obtained by subjecting lard or suet to distillation: the product consists of sebacic acid, mixed with much margaric and oleic acids, a little acetic acid, and empyreumatic oil: these are separated by a tedious process; and the sebacic acid, when pure, has the following properties:—it crystallizes in small colourless needles, is inodorous, has a slight taste, is heavier than water, and reddens litmus. It is much more soluble in hot water than in cold, and a hot saturated solution solidifies on cooling; alcohol dissolves it in great quantity at common temperatures. When heated it melts, and a large portion of it vaporizes: the air has no action upon it.

With the alkalis it forms neutral soluble salts; and if sulphuric, hydrochloric, or nitric acid be poured into a concentrated solution of a sebate, a large quantity of sebacic acid is immediately deposited.

Dumas and Peligot have analyzed this acid, and find it consists, when anhydrous, very nearly of

Eight equivalents of hydrogen	8 or	8·7
Ten equivalents of carbon . .	60 or	65·2
Three equivalents of oxygen .	24 or	26·1
Equivalent	92	100·

When sublimed, it contains an equivalent of water.

SEBASTIAN. [Portugal.]

SEBASTIAN, DOM, the posthumous son of the Infante Dom Joam, by Joanna, daughter of the emperor Charles V., was born at Lisbon, July 20th, 1554. After the death of his grandfather, Joam III., in 1557, Sebastian, who was then only three years old, ascended the throne of Portugal, the regency being vested in the widowed queen, Catherine of Austria, in conformity with the will of the late king. From infancy Sebastian showed that the love of arms would be his ruling passion. Possessed of a romantic disposition and an extraordinary admiration of chivalrous exploits, all his thoughts tended to the entire subjection of Africa, where his ancestors had made considerable conquests. At the age of twenty (in 1574) he undertook a campaign against the Moors of Africa, in which however he gained no advantage. Soon afterwards, the troubles which arose in Africa gave him the opportunity of carrying his gigantic projects into execution. Muley Abdullah, sultan of Fez and Morocco, had been succeeded by his son Muley Mohammed, in opposition to the order of succession established by the sherifs, that the sons should succeed in the order of their birth, to the exclusion of the grandsons, and which would have required the succession of his uncle. Knowing that his life was in danger, Abdu-l-múmen, the next brother of Abdullah, on whom the crown should have devolved, accompanied by his younger brothers Abdu-l-málik and Ahmed, fled to Tremecen, where he was put to death by assassins who were paid by his nephew. Abdu-l-málik retired to Algiers.

whence, having obtained the succour of the Turks, he marched to Marocco, defeated the usurper, who went out to meet him, and made himself master of that capital. Mohammed then solicited the aid of Philip II. of Spain; but as that monarch refused to give him any, he applied to Sebastian, who readily promised to replace him on his throne, against the advice of his best and wisest friends. However, before starting on his wild expedition, Sebastian communicated his design to Philip, who earnestly dissuaded him from it; though he has been unjustly accused by the French historian Laclède (*Histoire Generale d'Espagne*, vol. v., p. 170) of having encouraged him in his attempt, in the hope that he might perish, and the crown of Portugal devolve on himself. The preparations being completed, and the cardinal Enrique vested with the regency, in June, 1578, the armament put to sea. It consisted of nine thousand Portuguese, two thousand Spaniards, three thousand Germans, and six hundred Italians; in all about fifteen thousand men. These forces landed on the 10th of July at Arsila, where they were joined by Muley Mohammed at the head of his army. A council of war was immediately summoned; and after losing eighteen days, during which time the provisions of the army were greatly diminished, and the enemy were enabled to collect their forces, it was resolved to begin the campaign by the siege of Larache. Though on the arrival of his enemies Muley Abdu-l-málik, improperly called Moluc by the chroniclers of the day, was suffering under a disease which soon after caused his death, he had prepared with activity for their reception, and he hastened to the shore borne in a litter. His army, which was far superior in numbers to the Portuguese, being increased by the arrival of his brother Ahmed, governor of Fez, who joined him near Alcasr-kebir (Alcazarquebir), Abdu-l-málik determined to oppose the passage of the Christians over the river Luk in the way to Larache; and with this view he posted his troops at the only ford in the neighbourhood. Perceiving however that Sebastian, by the advice of his ally Mohammed, had desisted from his former intention, and was attempting to reach Larache by a more circuitous route, he crossed the river and offered him battle. The cavalry of the Christians, unable to withstand the impetuous onset of the Moors, at first gave way; but Sebastian placed himself at the head of his infantry, and charging the enemy, compelled him to fall back on his artillery. At this moment, Muley Abdu-l-málik, fearful of the result, mounted a horse, drew his sabre, and placing himself at the head of a body of cavalry, chiefly composed of Spanish Moriscoes whom Philip had banished from his kingdom after the revolt in the Alpujarras, made a desperate charge, by which the Portuguese infantry, consisting of raw soldiers, was broken. Though a vigorous resistance was made on the right and left wings, which were composed of the Germans and Spaniards, the rout soon became general. Sebastian made every effort to rally the fugitives; but in vain. Most of the officers and courtiers by whom he was surrounded fell by his side. Two horses had already been killed under him, and the third was exhausted. His retainers, anxious to save his life, earnestly entreated him to fly; but he haughtily refused, and plunged into the thickest of the fight, where he met with an honourable death, according to some authorities; others assert that he was taken prisoner by some Moors, but that as they were about to dispute about the possession of so rich a prize, one of their officers came up and killed him with his own hand. On the morning after the day of the battle a search was made, and a body was found, which, though much disfigured, was instantly recognised by Resende, a valet of Sebastian, to be that of his master. Mohammed succeeded in escaping from the field of battle; but he was drowned whilst attempting to cross the river. Abdu-l-málik, exhausted by the fatigue of the day, had also breathed his last during the action, though his death was kept secret by his orders; so that the three kings who entered the field perished on the same day.

Sebastian was succeeded by his brother Ahmed. The news of Sebastian's death caused the greatest consternation. The Portuguese could scarcely believe in his death, and for many years after it was generally supposed that he was still living in captivity. This belief produced several impostors, such as Alvarez, the stone-cutter, Gabriel de Espinosa, called by the Spaniards el Pastelero de Madrigal, and two others, who ended their days on the scaffold or in the galleys. By the death of Sebastian without issue, the kingdom of Portugal became annexed to Spain.

(Cabrera, *Historia de Felipe II.*, Mad., 1619, lib. xii.; Faria y Sousa, *Epitome das Historias Portuguezas*, part iii.; Vasconcellos, *Anacephalæosis.*)

SEBASTIAN DEL PIOMBO. [Piombo.]

SEBASTIAN, SAN, a large Spanish town, the capital of the province of Guipuzcoa, is situated at the mouth of the river Urumea or Gurumea, the Menosca of the antients (Pliny, lib. iii. 20), between two arms of the sea which form a peninsula. San Sebastian is much better built than many other Spanish towns. The streets are clean and wide, and the houses are elegant. The new square, Plaza Nueva, is characterised by correctness of design, and is surrounded by fine buildings. Being situated only ten miles from the mouth of the Bidassoa, which forms the boundary between the kingdoms of France and Spain, San Sebastian has long been a place of great strength, being surrounded with walls, and defended by bastions and half-moons, besides having a strong citadel called 'La Mota' upon an almost circular mountain of considerable height, which is ascended by a spiral road. The harbour is small, but very secure, being nearly enclosed by two moles, and protected from the winds by the neighbouring hills. The environs contain much romantic scenery, the whole being bounded by the lofty Pyrenees. A wooden bridge on eight piers serves as a communication between the two banks of the Urumea. San Sebastian has no monastic buildings of any importance, the whole having been set on fire and destroyed, together with the town, in the two sieges which it sustained during the Peninsular War. After the battle of Vittoria, Wellington dispatched General Sir Thomas Graham to occupy the town, which was then defended by General Rey. He besieged and bombarded it from the beginning of July, 1813; but, on his attempt to carry it by storm, he was repulsed by a sally of the garrison, and compelled to raise the siege. On the defeat of Soult at the foot of the Pyrenees, on the 30th of the same month, the siege was renewed, and continued to August 31st, during which the British suffered heavy losses in repeated assaults. On that day they became masters of the most important works, with the loss of about three thousand men; but the French still kept possession of the citadel, which did not surrender till the 9th of September. In 1823, when the French invaded Spain, to put down the constitutional government, they succeeded, after several assaults, in getting possession of San Sebastian by capitulation. More recently, during the Carlist insurrection in the northern provinces of Spain, it became the head-quarters of the British auxiliary legion, under General Sir De Lacy Evans, who, in the summer of 1836, had to sustain several attacks from the Carlists, who occupied the neighbouring heights.

SEBASTOPOL, or SEVASTOPOL, is a town in the south of European Russia, in the province of Taurida, which has risen within these few years into a place of great importance. When the Russians got possession of the Crimea, they soon became sensible of the value of the harbour, which is the finest in the Black Sea; in 1797 it was resolved to make it a harbour for ships of war, and in 1821 it was declared free for ships of all nations, coming from healthy ports, and laden with Russian or foreign goods. Sebastopol is built amphitheatrically on an eminence, and has broad straight streets. The view as you approach it on the land side is very striking. The houses are all of stone, and the public buildings, the Admiralty, the Arsenal, the barracks, the hospitals, the Lazaretto, and other establishments, such as the docks and dockyards, are on the most extensive scale, no labour or expense having been spared to make this port in all respects suitable to its destination as the station of the great Black Sea fleet. The bay runs nearly five miles into the land, is from 600 to 800 fathoms broad, and from 10 to 12 fathoms deep; it is perfectly protected from all winds and has no shoals. It divides into several branches or bays called by different names, as the Quarantine Bay, the Artillery Bay, and the Ship Bay, which is the finest and largest. 'The most and best of the fortifications of Sebastopol,' says Dr. Köhl, 'have been erected during the reign of the present emperor. The material is a white calcareous stone, obtained in the neighbourhood of the town. It resembles the shell-limestone of which Odessa is built, and is so soft that the walls would have little to fear from an enemy's ball, which would be buried in them as in sand; but this stone is extremely perishable, as we see in the houses of Odessa, which fall to pieces of themselves.' Dr. Köhl, who was at Sebastopol in 1838, says, 'It is more than laughable when our statistical works (for instance, the recent publications of Schnitzler) tell us that Sebastopol has only 5000 inhabitants. There are 10,000 resident inhabitants, not to mention the troops constantly employed on the fortifications, of whom nearly 30,000 are now encamped about the town, and the crews of the numerous men-of-war in the harbour.' The population is purely Russian, with a small mixture of Greeks.

(Hörschelmann; Cannabich; Köhl, *Reisen in Süd Russland*, 2 vols. 8vo., 1841.)

SEBENI'CO, a town in Austrian Dalmatia, is situated on the bank of a lake or bay of the same name, which is formed by the river Kerka, united with the Cicola, before it falls into the sea. The lake, which forms a large and excellent harbour, is connected with the sea by the channel of St. Antonio, a narrow strait between lofty rocks. The town is built on the declivity of a mountain, rising amphitheatrically from the sea, and has a striking appearance; but the streets are uneven and irregular, and the ascent to some of the higher parts of the town is by steps. With the two small suburbs, Sebenico contains about 800 well-built houses and 5000 inhabitants. The walls of the town are old and decayed, but there are two forts which lie above and command it, and the harbour is defended by the new and strong fort St. Nicolo, built on a rock at the mouth of the canal. It is the see of both a Roman Catholic and a Greek bishop. The large Gothic cathedral is accounted the handsomest in the whole country. There are two Roman Catholic churches and one Greek church, three monks' convents, and two nunneries. The adjacent country produces abundance of wine and oil. The inhabitants have distilleries of maraschino, and are reckoned excellent sailors. The coral fishery in the neighbouring seas is now abandoned.

SEBOO, River. [Marocco.]

SECA'LE CORNUTUM. [Ergot.]

SECAMO'NE, a genus of plants of the natural family of Asclepiadeæ, found in the warm parts of India, Africa, New Holland, and in the West Indies. The name is probably derived from the Arabic Sukmoonya, as this is the name in Prosper Alpinus of the *Secamone Alpinii*, or Periploca Secamone of Linnæus. The genus Secamone is characterised by having a quinquifid calyx and corol, the latter being rotate. Stamineous crown 5-leaved, with the leaflets compressed laterally. Pollen masses 20, erect. Stigma coarctate at top. Follicles smooth. Seeds numerous, hairy at the umbilicus. The species form erect or climbing smooth shrubs with opposite leaves; the flowers are small, and the inflorescence in cymes, which are dichotomous, arising from between the petioles.

Some of the species of Secamone secrete a considerable proportion of acrid principle, which makes them useful as medicines. Thus the roots of S. emetica, being emetic in action, are employed as a substitute for Ipecacuanha, whilst the substance called Smyrna Scammony is said to be obtained from the Egyptian species, Secamone Alpini of Rœmer and Schultes, the S. ægyptiaca of Mr. Brown.

SECANT, a line which cuts another; also a term in Trigonometry.

SECCHIO. [Po.]

SECEDERS, the name assumed, in preference to that of Dissenters, by the most numerous body of the Scottish Separatists. The term Dissenter, as being thought to imply a difference of doctrinal belief, is little used in Scotland, where all the more considerable non-conforming communities are equally Calvinistic with the established church, and indeed adhere to the same standard of belief (the Westminster Confession), differing only as to certain points of church government. Even as to that matter indeed the Seceders are at one with the national church in theory: their quarrel is, or at least originally was, merely about one or two points of practice.

The Secession originated in the year 1733; and was occasioned by two acts of the General Assembly; the first, passed in 1730, for putting an end to the practice of recording the protests, or reasons of dissent, given in by individual members against the decisions of church judicatories; the other, passed in 1732, providing that in cases in which what is called the *jus devolutum*, or right of the presbytery to nominate to vacant livings in consequence of no qualified person being presented by the patron within six months, came into operation, the presbytery should always appoint the person chosen by the heritors and elders. This was in fact to restore in such cases the comparatively popular mode of appointment which had prevailed universally from the year 1690, when presbytery was restored in Scotland, down to the year 1712, when the antient patrons had been reinstated by act of parliament in the rights taken from them at the Revolution. But the act of 1732 was dissatisfactory to a very small minority in the church because it did not go farther, so as, instead of the law of 1690, to restore (in the cases in which the appointment fell to presbyteries) the still more democratic practice which had been established in 1649, placing the election with the elders, or members of the kirk session, alone. This law had subsisted from 1649 till the Restoration. It is not uncommon to represent both the system of 1649 and that of 1690 as giving the right of election to the general body of the parishioners or congregation; but in truth it was not so. All that was left to the congregation under either system was the right of expressing their disapproval of the choice made by the elders, or by the elders and heritors; but it remained with the presbytery, or church court, to give what effect it chose to such disapproval; to order a new election, or to proceed to settle the nominee in defiance of the dissent of the congregation, which in that case was, according to the procedure under the system of 1649, declared to be 'grounded on causeless prejudices.'

The clergyman who took the lead in the movement against the acts of 1730 and 1732 was the Reverend Ebenezer Erskine, then one of the ministers of Stirling. He was one of fifteen members of Assembly who protested against the passing of the act of 1732. The Assembly having (in conformity with the act of 1730) refused to record this protest, Erskine inveighed against the proceeding as arbitrary and tyrannical, in a sermon which he preached a few months after before the synod of Perth and Stirling. Upon this sermon the synod passed a resolution of censure, from which Erskine appealed to the General Assembly; but the sentence was confirmed by that supreme court in 1733, and he was actually rebuked and admonished at the bar of the house. He protested, three other clergymen adhering to him, against this decision, and declared he would continue the conduct for which he had been censured; upon which the Commission of Assembly was authorized to proceed against the four protesters, and they were suspended in August, 1733, and deposed on the 16th of November following. This sentence of the Commission however was removed by the Assembly of 1734, which at the same time repealed both the act of 1730 and that of 1732. But in the meantime the deposed brethren, having been joined by four other clergymen, had constituted themselves into a separate presbytery; and they now refused to rejoin the general body of the church, until, as they said, they should have satisfactory evidence that its future conduct would be such as they could approve of. In this state matters remained, the eight clergymen all continuing to officiate in their several churches as usual, till the affair was once more brought before the Assembly of 1739. Even in that house the motion for proceeding to a sentence of deposition was lost; but they were finally deposed, and their parishes declared vacant by an act of the next Assembly, passed 15th May, 1740, by a majority of 140 to 30.

The Seceders, or Associate Synod, as they called themselves, remained a united body till the 9th of April, 1747, when they split into two on a quarrel about a clause in the oath required to be taken by the burgesses or freemen of some of the Scots burghs declaratory of their profession and hearty allowance of 'the true religion at present professed within the realm, and authorized by the laws thereof;' the larger division, who held that the oath might conscientiously be taken by Seceders, calling themselves Burghers, their opponents taking the name of Anti-burghers. But in 1820 the Burghers and Anti-burghers coalesced again into the United Associate Synod.

The practice of subscribing the Solemn League and Covenant was made imperative upon all members of the Secession by the Associate Synod in 1744; but although the act of the synod has never, we believe, been repealed, it fell into disuetude after a few years. One chief cause of this was the growth among the Seceders of opinions adverse to the principle of national religious establishments altogether, a principle strongly maintained, and placed on very high ground, in the Covenant. But this change of sentiment gave rise in 1806 to the separation of another portion of the body, who, adhering to the principle of an established church, which the founders of the secession, although objecting to some things in the existing constitution or practice of the church of Scotland, undoubtedly held, called themselves the Original Seceders; and these are also divided into the Original Burghers and the Original Anti-burghers. A good many of the congregations of the Original Burgher Synod have lately rejoined the national church.

All the divisions of the Seceders, we believe, agree in adopting as their standards, in addition to the Westminster Confession of Faith, what is called the First or Extra-Judicial Testimony, emitted by their founder Erskine and his brethren in 1733, and a more extended exposition of their principles and views, known as the Second or Judicial Testimony, which they published in 1736. The United Associate Synod, to which the great mass of the Seceders belong, now comprehends about 350 congregations, arranged in 22 presbyteries. The entire population, including members, hearers, and children, belonging to all the branches of the Secession church may be estimated at about 350,000.

(*Historical Account of the Rise and Progress of the Secession*, by the Rev. John Brown of Haddington; *Life and Diary of the Reverend Ebenezer Erskine*, by the Reverend Donald Fraser, of Kennoway, 1831; M'Culloch's *Statistical Account of the British Empire*, vol. ii.)

SECHEM. [PALESTINE.]

SECKENDORF, VEIT LUDWIG VON, was born on the 20th of December, 1626, at Herzogenaurach near Erlangen. He belonged to an old and noble family of Franconia, and his father held a high post in the army of Gustavus Adolphus during the Thirty Years' war. The boy lived with his mother partly at Coburg, partly at Mühlhausen, and partly at Erfurt. He began his studies at the gymnasium of Coburg in 1638; but Ernest, duke of Gotha, invited him to the gymnasium of Gotha; and after the death of his father, who was executed in 1642 by a Swedish court-martial, the duke acted towards the youth with all the care of a father. The young man showed great talent and unusual diligence, and persons of the highest rank gave him their protection and encouragement. From 1643 till 1646 he studied in the university of Strassburg; and applied most zealously not only to jurisprudence, history, and classical literature, but to philosophy and theology. After he had completed his studies, he made a journey through the Netherlands, and was appointed page to the duke of Gotha, who not only superintended his practical training as a statesman, but entrusted him with the care of his library. Seckendorf now gradually rose from the lower to the highest offices in the duke's service, and in 1664 he was appointed privy councillor and chancellor. In all his offices he took a most active part in the important changes which the duke made in the administration of his dominions, as well as in the affairs of religion and the education of the people. For reasons which are not known, Seckendorf, at the close of the year 1664, left the service of the duke of Gotha, and entered that of Moritz, duke of Zeitz, who appointed him his privy councillor, chancellor, and president of the consistory. In his new sphere Seckendorf showed the same activity and good will towards the people as before; but owing to some measures which he had proposed, he became involved in disputes with the clergy; and when Duke Moritz died in 1681, he laid down his offices, and retired to his country-seat, Menselwitz near Altenburg. In 1691 Frederic III., elector of Brandenburg, invited him to Berlin as his privy councillor, and also appointed him chancellor of the newly established university of Halle. Seckendorf accepted the offer, but died in the year following, 1692, at Halle.

Seckendorf as a statesman showed great judgment and skill in the complicated affairs of the various houses of Saxony, but he was more distinguished as a political writer, an historian, a scholar, and a theologian. His principal political work is—'Deutscher Fürstenstaat,' Gotha, 1665, which for a long time was thought the most useful manual of political science. His theological and historical works are: 'Compendium Historiæ Ecclesiasticæ,' Leipzig, 1666; this work was completed by Artopæus; 'Der Christenstaat,' Leipzig, 1685; 'Commentarius Historicus et Apologeticus de Lutheranismo,' &c., Leipzig, 1688, &c., 3 vols. fol.: it is chiefly directed against Maimbourg, 'Histoire du Luthéranisme.' Seckendorf also wrote several smaller discourses in German, and sacred hymns, some of which are still sung in the Protestant churches of Germany. See Schreber, 'Historia Vitæ et Meritorum Viti Ludovici à Seckendorf,' Leipzig, 1733, 4to.

SECKER, THOMAS, born 1693, died 1768, a learned and eminent prelate of the English church, who was successively bishop of Bristol and Oxford, and archbishop of Canterbury.

The early history of this distinguished person is essentially different from that of many other persons whose early life, progress, and final success in the church we have had to describe; for while they have usually gone from the endowed grammar-schools to the universities of the realm, Secker (being born of parents who were not members of the Church of England, but dissenters from it), after he had been trained in the grammar-school at Chesterfield in Derbyshire, where a sister much older than himself and her husband Mr. Milnes resided (two relatives who had much to do with his early training), was sent to an academy which the dissenters of the north of England had established at a village called Attercliffe, about fourteen miles from Chesterfield. It was intended for the education of dissenting ministers, and for that profession young Secker was designed. Many ministers who were considered ornaments to the profession were educated in this academy. But after a residence of two or three years, he was removed to another establishment of the same kind, in which the studies appear to have been of a more liberal kind, and the learning communicated to the pupil more exact and critical. This academy was kept at Tewkesbury, and at the head of it was Mr. Jones, a divine of considerable eminence. Here Secker found Samuel Chandler going through the same course with himself, who was a minister of much celebrity among the dissenters, and author of various critical works, and Butler, the author of 'The Analogy of Natural and Revealed Religion,' who conformed and became bishop of Durham. With both of these divines Secker formed an intimacy, and they remained on friendly terms during the remainder of their lives.

It was in these academies that the foundation was laid of those eminent theological attainments by which he was distinguished, of which his printed works are some proof, but there is still stronger evidence in his manuscript notes on the Scriptures, which still remain in the library at Lambeth.

When he left the academy, the natural course would have been that he should have settled as the minister of a dissenting congregation. He preached among the dissenters occasionally, but he never became the settled pastor of any dissenting congregation. Perhaps the excellencies of his character were not appreciated as they ought to have been by the persons amongst whom he fell. However, it is certain that he soon determined to abandon the path which had been chalked out for him, and he devoted himself to the study of medicine, attending lectures in London, and going afterwards to Paris.

There were persons however who were unwilling that the talents and attainments of Secker should not be made available in the way that was first intended, though not as a nonconformist to the church, but as a minister of the church itself; and particularly his early friend Butler, who had conformed and was become preacher at the Rolls, and Mr. Talbot, to whom Butler introduced him, a son of the bishop of Durham. Secker was induced to enter fully into the question of conformity, and his deliberations issued in the determination to enter the church. He entered himself at Exeter College, Oxford, and in a very short time was ordained by the bishop of Durham; this was in 1723.

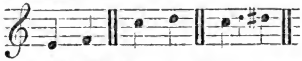
His progress in the church was rapid. He was made chaplain to bishop Talbot; had the living of Houghton-le-Spring, which he soon exchanged for that of Ryton, both in the diocese of Durham; but in 1732 he was brought into a more public sphere of action, being nominated one of the king's chaplains, and rector of St. James's, Piccadilly. Early in 1735 he was made bishop of Bristol; in 1737 he was translated to Oxford. In 1750 he gave up the rectory of St. James's, in which parish he had accomplished some useful reforms, and was made dean of Saint Paul's. In 1758 he became archbishop of Canterbury.

In all the various situations which he was called to fill, his conduct was that of a conscientious, liberal, and pious man; assiduous in the discharge of all his duties, acting with moderation and discretion. His printed works consist only of sermons, lectures, and charges.

He died on the 3rd of August, 1768, and is buried in an humble grave in the churchyard of Lambeth parish.

SECOND, the sixtieth part of a minute, whether of time or of angular measure. [Angle; Time.] For the derivation of this word, see Scruple.

SECOND, an interval in music, a discord, the ratio of which is 9 : 8. Of seconds there are three kinds: the minor second, or semitone, as E F; the major second, C D; and the extreme sharp second, C D♯. Ex.:



SECOND-SIGHT, a power believed to be possessed by some persons in the highlands and islands of Scotland, of foreseeing future events, especially of a disastrous kind, by means of a spectral exhibition of the persons whom these events respect, accompanied with such emblems as denote their fate.

Jamieson says, 'Whether this power was communicated to the inhabitants of the highlands and islands of Scotland by the northern nations, who so long had possession of the latter, I shall not pretend to determine; but traces of the same wonderful faculty may be found among the Scandinavians. Isl. *ramskygn* denotes one who is endowed with the power of seeing spirits: "qui tali visu prœter naturam prœditus est, ut spiritus et dæmones videat, opaca etiam visu penetret." Verel. Ind. The designation is formed from *ramm-ur*, viribus pollens, and *skygn*, videns; *q. e.* powerful in vision.'

Dr. Johnson, in his journey to the Western Islands of Scotland, carefully examined the questions of the second-sight; but neither he nor Dr. Beattie could find sufficient evidence of its reality.

In Sir John Sinclair's *Statistical Account of Scotland*, vol. iii., 8vo., Edinb., 1792, p. 380, the minister of Applecross, in the county of Ross, speaking of his parishioners, says, 'with them the belief of the second-sight is general.'

In MacCulloch's *Western Islands of Scotland*, 8vo., Lond., 1819, vol. ii., p. 32, the author says, 'To have circumnavigated the Western Isles without even mentioning the second-sight would be unpardonable. No inhabitant of St. Kilda pretended to have been forewarned of our arrival. In fact it has undergone the fate of witchcraft; ceasing to be believed, it has ceased to exist.'

In the Erse the second-sight is called *Taisch*.

(Johnson's *Works*, Murphy's edit., vol. viii., p. 329; Beattie's *Essays*, 8vo., Edinb., 1776, p. 480; Brand's *Popular Antiq.*, ed. 4to., vol. ii., p. 479; Jamieson's *Etymolog. Dictionary*, Supplem., *in voc.*)

SECONDARY, a name given to any circle on the sphere with reference to another circle: if the latter be called primary, the former is secondary when it passes through the poles of the primary. [Sphere.]

SECRETARY (French, *Secrétaire*), one entrusted with the secrets of his office or employer; one who writes for another. Its remote origin is the Latin *secretum*. The phrase 'notarius secretorum' is applied by Vopiscus (*Div. Aurelianus*) to one of the secretaries of the emperor Aurelian. This appellation was of very early use in England: Archbishop Becket, in the reign of Henry II., had his 'secretarius;' although the person who conducted the king's correspondence, till the middle of the 13th century, was called his clerk only, probably from the office being held by an ecclesiastic. The first time the title of 'secretarius noster' occurs is in the 37th Hen. III., 1253.

SECRETARY-BIRD. [Gypogeranus.]

SECRETARY OF STATE. The office of secretary of state is one of very antient date, and the person who fills it has been called variously 'the king's chief secretary,' 'principal secretary,' and, after the Restoration, 'principal secretary of state.' He was in fact the king's private secretary, and had custody of the king's signet. The duties of the office were originally performed by a single person, who had the aid of four clerks. The statute 27 Henry VIII., c. 11, regulating the fees to be taken by 'the king's clerks of his grace's signet and privy seal,' directs that all grants to be passed under any of his majesty's seals shall, before they are so sealed, be brought and delivered to the king's principal secretary or to one of the clerks of the signet. The division of the office between two persons is said to have occurred at the end of the reign of Henry VIII., but it is probable that the two secretaries were not until long afterwards of equal rank. Thus we find Sir Francis Walsingham, in the time of Queen Elizabeth, addressed as her majesty's principal secretary of state, although Dr. Thomas Wilson was his colleague in the office. Clarendon, when describing the chief ministers at the beginning of the reign of Charles I., mentions the two secretaries of state, 'who were not in those days officers of that magnitude they have been since; being only to make dispatches upon the conclusion of councils, not to govern or preside in those councils.' Nevertheless the principal secretary of state must, by his immediate and constant access to the king, have been always a person of great influence in the state. The statute 31 Henry VIII., c. 10, gives the king's chief secretary, if he is a baron or a bishop, place above all peers of the same degree; and it enacts that if he is not a peer, he shall have a seat reserved for him on the woolsack in parliament; and in the Star Chamber and other conferences of the council, that he shall be placed next to the ten great officers of state named in the statute. He probably was always a member of the privy council. Cardinal Wolsey in his disgrace earnestly implores Secretary Gardiner (afterwards bishop of Winchester), whom he addresses as a privy councillor, to intercede for him with the king. (Ellis's *Letters*, vol. ii.) Lord Camden, in his judgment in the case of Entick *v.* Carrington (11 Hargrave's *State Trials*, p. 317), attributes the growth of the secretary of state's importance to his intercourse with ambassadors and the management of all the foreign correspondence of the state, after the policy of having resident ministers in foreign courts was established in Europe. Lord Camden indeed denies that he was antiently a privy counsellor.

The number of secretaries of state seems to have varied from time to time: in the reign of George III. there were often only two; but of late years there have been three principal secretaries of state, whose duties are divided into three departments, viz. for home affairs, foreign affairs, and the colonies. They are always made members of the privy council and the cabinet. They are appointed (without patent) by mere delivery to them of the seals of office by the king. Each is capable of performing the duties of all the three departments, and the offices are all so much counted to be one and the same, that upon being removed from one secretaryship of state to another, a member of the House of Commons does not vacate his seat.

To the secretary of state for the home department belongs the maintenance of the peace within the kingdom and the administration of justice so far as the royal prerogative is involved in it. All patents, charters of incorporation, commissions of the peace and of inquiry pass through his office. He superintends the administration of affairs in Ireland.

The secretary for foreign affairs conducts the correspondence with foreign states, and negotiates treaties with them either through British ministers resident there, or personally with foreign ministers at this court. He recommends to the crown ambassadors, ministers, and consuls to represent Great Britain abroad, and countersigns their warrants. The secretary for the colonial department performs for the colonies the same functions that the secretary for the home department performs for Great Britain. Each is assisted by two under-secretaries of state, nominated by himself, the one being usually permanent, the other dependent upon the administration then in power. There is likewise in each department a large establishment of clerks appointed by the principal secretary.

The power to commit persons on suspicion of treason is incidental to the office of principal secretary of state—a power which, though long exercised, has been often disputed. It is not necessary here to give the arguments on both sides; they are discussed with great care by Lord Camden in the case above cited (Entick *v.* Carrington), which was one of the numerous judicial inquiries arising out of the dispute between the Crown and John Wilks at the beginning of the reign of George III. The conclusions to which Lord Camden comes are—that the secretary of state is not a magistrate known to the common law; that the power of commitment for state offences, which he has for many ages exercised, was used by him as an immediate delegation from the person of the king, a fact which may be inferred, among other things, from the debates in parliament in the time of Charles I., when Secretary Cook claimed the power on that ground; that nevertheless courts of justice must recognise this power, inasmuch as there has been constant usage of it, supported by three judicial decisions in favour of it since the Revolution, viz. by Lord Holt in 1695 (Rex *v.* Kendal and Rowe); by Chief-Justice Parker in 1711 (Queen *v.* Derby); and by Lord Hardwicke in 1734 (Rex *v.* Earbury). In a more recent case (King *v.* Despard, 1798), Lord Kenyon says, 'I have no difficulty in saying that the secretaries of state have the right to commit,' and he hints that Lord Camden felt too much doubt on the subject.

There is also a chief secretary for Ireland, resident in Dublin (except when parliament is sitting), and having always an under-secretary there. He corresponds with the home department, and is under the authority of the lord-lieutenant. His office is called that of secretary to the lord-lieutenant; but it is analogous to the office of secretary of state. He has sometimes, though very rarely, been a member of the cabinet.

SECRETION, in animal physiology, is one of the processes by which a substance is separated from the blood or an analogous organic fluid. The same term is also often applied to the material separated. Secretion differs from nutrition, in which a fluid is also at first separated from the blood, in the purpose for which it is carried on, and in the mode in which the fluid is afterwards disposed of. In nutrition [NUTRITION] the fluid is converted into the tissues of the body or into organized structures; in secretion it usually remains fluid, and if not, it never acquires any organization.

Secretion from the blood of animals (which may be regarded as the type of all fluids serving a similar common purpose) takes place in the interspaces of all the tissues, on the surfaces of all the membranes, into the interior of all the cavities of the body, and into the ducts of glands. In the three first situations the separation is sometimes called exhalation, and it is probable that in them it is effected by a force different from that under the influence of which it takes place in the secretion, peculiarly so called, in the glands.

The fluid which keeps all the tissues moist, and which is effused on the free surfaces of all the serous membranes, is exactly similar to the serum, or thinner fluid part of the blood. It is, in all probability, separated from the blood by the capillary attraction of the several tissues, which imbibe into their pores the thinner part of the fluid that continually traverses them in the minute capillary blood-vessels.[*] This imbibition is also assisted by the pressure with which the blood, impelled by the contractions of the heart, is forced upon the internal wall of those vessels; and hence it is that in all cases in which, by any obstruction to the circulation through the veins, this pressure of the blood is increased, some form of dropsy is produced; for the serous fluid is thus forced in excessive quantity into the pores of the tissues, and through the surfaces of the membranes, of all the parts in which the circulation is obstructed.

In the article GLAND, SECERNENT, we have described the general character of the structures in which the secretions proper are produced. But since that was written, the researches of Boehm, Henle, and others have rendered it probable that the fluid of a secretion is not merely separated from the blood in the capillaries that ramify on the walls of the minute gland ducts, and then made to traverse at once the walls of both those vessels and those ducts, but that it is first collected in minute cells which surround the terminations of the ducts, and that it is only when these cells burst or have their membranes removed that the secreted fluid is poured into the gland duct. Through it, it is at once conveyed, probably by the contractile power of the duct and those to which it leads, to the part at which its ultimate purpose is to be effected. While collected in the minute cells it is highly probable that the fluid undergoes changes in its condition, and acquires the properties necessary for the peculiar offices (if any) which it has to perform. The nature of this change, and the force by which it is effected, are unknown; but we may imagine the change to be somewhat similar to that by which the juices contained in the cells of a fruit have their character gradually altered in the process of ripening.

The degrees of elaboration necessary for the production of the several secretions probably vary greatly. A part at least of the materials of some of them exist ready formed in the blood, as the urea and lactic acid of the urine and sweat, and some of the principles of the bile; of others no trace can be found in the blood itself. The former seem to require no particular structure for their separation, for though in general they are separated only by their appropriate glands, yet when they cannot pass off by them, they are found in all the fluids drawn from the blood by the ordinary imbibition of the porous tissues. The other fluids, which are not found in the blood, are probably elaborated entirely in their respective glands, though it must be admitted that the analysis of the blood is not yet sufficiently perfect to render it certain that they do not exist in it ready formed and requiring only to be selected from its other constituents.

The purposes which the secretions serve are various. Some, as already stated, have no other purpose than to moisten the several parts of the body; others are appropriated to the service of important functions, as the saliva, the gastric juice, the bile, and the pancreatic and intestinal fluids, which all assist in digestion. Such also are the tears, which serve for the cleansing of the front of the eye; the milk for the food of the offspring; and various materials for the defence and comfort of the animal, and for the propagation of the species. Other secretions again, which are commonly called excretions, are the refuse of the blood, and if retained in it would exercise an injurious influence on the whole economy; such are the cutaneous perspiration, the urine, and those parts of the bile and intestinal fluids which are not used in digestion.

For the account of particular secretions we must refer to the articles relating specially to them or to the parts by which they are produced, such as BILE; GLAND; INTESTINES; LIVER; MAMMARY GLAND; MILK; MUCUS; PANCREAS; SALIVA; SKIN; STOMACH; &c.

SECRETIONS, VEGETABLE, are those products found in plants which are chiefly the result of the decomposition of carbonic acid and the appropriation of the carbon to which we have already alluded in the article Sap. [SAP.] These secretions are exceedingly numerous, and constitute the great bulk of the solid parts of the plant. The differences observed in the hardness and durability of the wood, the colour of the leaves and flowers, the flavour of the various fruits, the medicinal and economic l properties of all parts of plants, are dependent on the nature of the secretions that constitute, and are deposited within, these tissues. The intricate and delicate chemistry by which the secretions of plants, possessing so many and varied properties, are elaborated from so small a number of elementary constituents, is at present very imperfectly understood. We however know that whatever compounds may be found in the structure of plants, the elements of which they are composed are derived from external sources, and that the chemical processes by which their elements are combined obey similar laws to those which govern them when independent of the influence of vitality.

In the lowest forms of plants we find the simple cell endowed with the power of abstracting from the medium in which it lives the elementary matters which it combines in those forms that are essential to its existence. In the simple cell the changes which are thus effected are very few, but as we ascend in the scale of organization the cells are united. Their forms are varied, the functions which were performed by one cell are assigned to different sets of cells, and the compounds required by the plant and the changes in its elementary matters become more numerous and complicated. In the article SAP it was stated what the nature of those elements is, which, on being introduced into the system of the plant, constitute the materials necessary for the formation of those secretions on which the growth and existence of plants depend, and in this place we shall proceed to enumerate those secretions and state their properties.

I. *Of General or Nutritious Secretions.*—These are found, in one form or another, in all plants, and are sometimes collected in large quantities in various parts of the plant, to serve as material for its future growth. They have hence been called general and nutritious secretions. They seem to be more immediately the result of the union of the elements of water with the carbon of the carbonic acid than any of the other secretions, and, on account of their composition, have been called, by De Candolle, *Hydro-carbonates*. The relative quantities of their component parts, according to Gay-Lussac and Thénard, are as follows:—

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[*] There is reason to believe that the fluid which moistens the tissues and fills the cavities of the nervous centres is not separated in this common method.

	Carbon.	Oxygen.	Hydrogen.
Gum . .	42·23	50·84	6·93
Sugar . .	42·27	50·63	6·90
Starch .	43·55	49·68	6·77
Lignine .	52·00	41·25	5·75

It will be seen that there is a great similarity in the composition of all these substances, and that only a small addition or abstraction of elementary matter will convert the one into the other. There are two remaining substances, albumen and gluten, which, in addition to the other elementary bodies, contain nitrogen. Their composition in 100 parts is as follows:—

	Carbon.	Oxygen.	Hydrogen.	Nitrogen.
Albumen . .	52·8	23·8	7·5	15·7
Gluten . . .	55·7	22·0	7·8	14·5

1. *Gum* is the most widely diffused of these secretions, and in some of its forms appears to be the first product which is formed by plants. Vegetable *mucus*, which is the most simple form of gum, exists in a dissolved state in many of the Cryptogamia, also in Malvaceæ, Liliaceæ, Orchidaceæ, and many of the Boraginaceæ. In many other plants gum exists in a dissolved state in the fluids, but becomes hardened, either by being deposited in peculiar receptacles, in the leaf or other parts of the plant, or by being thrown out upon its surface. In this latter mode large quantities of gum are produced by some Leguminous plants. The various sorts of gum-acacia found in the markets are produced from the *Acacia Arabica*, *A. Senegal.*, *A. tortilis*, &c. [GUM.] The substance called *Bassorin* is also a modification of gum. It differs in not being soluble in cold water, but takes up fifty times its weight, forming a kind of jelly. In chemical composition it differs from gum in containing less carbon. Vegetable jelly, or *Pecten*, is another form of gum. It resembles bassorin in some of its properties, but is at last entirely soluble in cold water. With saccharine matter and various acids it exists in the juice of most fruits, as strawberries, raspberries, gooseberries, oranges, &c. It is also found in the fluid called cambium, which is secreted between the bark and the trunk of the tree in spring. According to Braconnot, pecten is capable of forming an acid and uniting with alkalis.

2. *Sugar* is the secretion which is found in the next greatest abundance to gum, and the chemical analysis will point out how little change is required for the formation of this substance from gum. It is very generally diffused throughout the vegetable kingdom, and if it does not exist in the fully developed plant, it is always found in the seed during the germination of the young plant. [GERMINATION.] There are several varieties of sugar, or saccharine principles, developed in plants, which have received different names, as cane sugar, or the sugar of commerce, grape-sugar, liquorice, manna, &c. [SUGAR.]

3. *Starch*, or *Fecula*, is the most abundant of the nutrient secretions of plants, and is most used by man. It differs slightly in composition from the two last, and an addition of carbon and abstraction of oxygen will convert it into either the one or the other. It occurs in the form of little granules, which are always surrounded by a delicate tissue, which becomes coloured blue by iodine. As it is the great source of nutriment for the younger parts of plants, it is found deposited in the cellular tissue in almost all the organs of plants, as in the tubers intended to nourish young shoots, in all fleshy roots and bulbs or rootstocks which have to furnish food to young stems, in the stems, the receptacles, seeds, or other parts of plants where it may be required for affording nutriment to the younger growing organs of the plant. [STARCH.] In what manner the granules of starch are appropriated by the younger parts of the plant we are in a great measure ignorant: when removed from the plant, starch requires boiling water to dissolve it, and this is effected by the bursting of the tissue that envelopes the granule. This process must take place in the introduction of the starch to the younger parts of the plant, but it cannot be by the same agency, and is probably the effect of causes that have hitherto evaded observation.

4. *Lignine* is the ultimate result of vegetation upon the secretions previously mentioned. Gum, sugar, and starch are produced and then converted into lignine, which is a harder secretion than the former, and is found to constitute the principal ingredient that is deposited in the hardened tissues of plants. It differs from the former in chemical composition by possessing less oxygen and hydrogen and more carbon. It thus possesses less of the elements of water and more solid matter, and it is probably according to the amount of the latter that the timber of various trees differs in hardness and durability. The following are the proportions of carbon in various kinds of wood, according to Gay-Lussac and Thénard and Prout:—

Cormouma-wood . .	55	per cent.
Iron-wood . . .	53·44	,,
Oak	52·53	,,
Beech	51·45	,,
Box	50	,,
Willow . . .	49·80	,,

We may sum up the changes which these various secretions undergo, in the language of the writer of the article 'Botany,' in the *Library of Useful Knowledge*:—'The rising sap passes into the leaves charged with carbonic acid or matter capable of being converted into it; it loses a large proportion of its water by evaporation, and of its oxygen by the decomposition of its carbonic acid, and thus becomes reduced to carbon and water in an inspissated state, which is gum when free, and lignine when fixed. From the lignine is organised the tissue among which the gum circulates for its support and consolidation, and within which it is also enclosed and elaborated into various other principles, remaining as starch when but little changed. A portion of the gum settles downwards through the stem; that part which is in the bark, being intercepted by no opposing current, finds its way to the roots; that part in the alburnum is caught by the ascending sap, dissolved in it and carried again into the leaves, there to undergo changes similar to what it had previously experienced. Whenever the gum meets in its course with cells that are empty, it is absorbed by them, and becomes subject to their special vital powers, changing to the principles which each particular species or organ has the property of elaborating, and the most readily to those which, like sugar, have the greatest chemical resemblance to itself' (pp. 100, 101).

5. *Albumen*, *Glutin*, or *Emulsin*, is one of the vegetable secretions that contain nitrogen, and which thus form a link between the proximate elements of animal and vegetable tissues. Glutin is found in the milk of all plants, and also with the starch found deposited in various seeds. Fluids in which it is contained become flocky when exposed to heat. It is also thrown down from them by acids, alcohol, and tannin. When the tubers of the potato are submitted to heat, a glairy fluid is separated which contains glutin. In the milk of the cow-tree it is found in the greatest abundance. When it occurs in the seeds of plants, it is sometimes called *Emulsin*, and is the cause of the milkiness of the fluids called emulsions, formed by rubbing seeds of various kinds with water.

6. *Gluten* is another compound containing nitrogen, and is found frequently in combination with the last substance and starch. It is found in the greatest abundance in the seeds of gramineous and leguminous plants. When moist, it is a white, transparent, tenacious, elastic, glutinous substance. When dry, it is colourless and scentless, and insoluble in water. It is soluble in boiling alcohol and acids, and is precipitated from the latter by ferro-cyanuret of potassium. All fluids in which it may be present combined with sugar are capable of fermentation, and it forms the basis of the several ferments that are used for exciting the process. Both gluten and emulsin are important agents in the nutrition of plants; their presence also indicates the comparative nutritious qualities of food for man, as will be seen by the following analyses from De Candolle:—

	Amylum, or Starch.	Gluten and Emulsin.
Wheat . .	70·00	23·00
Barley . .	79·00	6·00
Rye . .	61·00	5·00
Oats . .	59·00	6·00
Rice . .	85·07	3·60

II. *Of Special or Local Secretions.*—The greatest variety in the secretions of plants is in those which are not generally secreted and diffused throughout the system of the plant, but are either secreted in a particular part of plants for a special purpose, or are secreted by particular species of plants. These may be arranged under the heads of acids, alkalis, neuter principles, resinous principles, colouring-matters, milks, oils, resins, &c.

1. *Acids* are the most numerous group of vegetable secretions, and the chemist is constantly adding new ones to their number. They are generally found in combination

with the various earths and alkalis which exist in plants; they are however frequently free, and contribute to the flavour of the fruits of many plants. The vegetable acids may be divided into two classes: those possessing only carbon and oxygen, as carbonic and oxalic acids; and those possessing hydrogen in addition, as acetic, malic, citric, tartaric, and equisetic acids. Of all the acids, acetic is most common in plants, which may be the result of changes taking place similar to those which occur in the process of acetous fermentation. The change of elements necessary for the production of acid from the fecula of vegetables may be seen by the following atomic analysis from Meyen (*Pflanzen Physiologie*, band ii., p. 301):—

	Amylum, or Starch.	Citric Acid.	Tartaric Acid.	Acetic Acid.	Malic Acid.	Equisetic Acid.
Carbon	12	4	4	4	4	4
Oxygen	10	4	5	3	4	3
Hydrogen	20	4	4	6	4	2

The most remarkable of the vegetable acids is tannic acid, or tannin. It is frequently placed among the neuter principles of vegetation, but it reddens litmus, combines with salts, and in other properties agrees with acids. [Tannin.]

2. *Alkalis.*—The substances thus called resemble the alkalis of the inorganic kingdom only in the property they possess of uniting and forming salts with acids. They are compound bodies containing carbon, oxygen, hydrogen, and nitrogen. They do not dissolve readily in cold or hot water. Although they differ little in chemical composition, yet they possess all the properties of the plant in which they are produced. The following table by Liebig and others gives the atomic constitution of the most powerful of these alkalis:—

	Morphine.	Codine.	Narcoline.	Strychnine.	Brucine.	Quinine.	Cinchonine.
Carbon	34	32	40	30	32	20	20
Hydrogen	36	39	40	32	36	24	22
Nitrogen	2	2	2	2	2	2	2
Oxygen	6	5	12	3	6	2	1

To these might be added a long list of others, as almost every natural order has its peculiar alkali, which exists in the plant in a state of combination with a peculiar acid. The mode of obtaining these alkalis consists in adding a strong mineral acid to a decoction of the plant, which takes up the alkali, and which may be afterwards precipitated from its solution by some mineral alkali.

3. A number of principles have been detected and described by chemists, which are neither acid nor alkaline, and have therefore been called *neuter principles*. The progress of chemistry will however probably place them in some of the other classes. The most remarkable of these are pollenine, berberine, asparagine, emetine, coffeine, gentianine, and fungine. Another series of these principles are those which possess resinous properties, and hence are called *resinous principles;* to these belong quassine, cathartine, elaterine, piperine, jalapine, digitaline, and several other principles named after the plants from which they are obtained.

4. *Colouring-Matters.*—In the article Sap it was stated that a peculiar substance called *chromule* was the cause of the green colour in plants generally, and it is supposed that this substance may undergo some changes which enable it to give all the colours which are observed in the vegetable kingdom. Whether chromule is the origin of these secretions or not, they are exceedingly numerous, and many of them have been carefully analyzed by chemists. Colouring-matters may be divided into two classes, those which possess nitrogen, and those which are without it. In the former class is indigo, which exists in a great number of leguminous plants, and is an important article of commerce. [Indigo.] The latter class contains the numerous red, yellow, blue, and brown colouring-matters, many of which possess peculiar properties, a knowledge of which is made subservient to the art of dyeing. Amongst these are santaline, the colouring principle of red sanders wood; polychroite, that of saffron; rheadine, that of the red poppy; rhubarbine, of rhubarb, &c.

5. *Milks, or Milky Fluids*, are occasionally very abundant in plants, characterising entire families. Euphorbiaceæ, Papaveraceæ, Apocynaceæ, Asclepiadaceæ, Campanulaceæ, Convolvulaceæ, and Artocarpaceæ, among the Dicotyledons, and Liliaceæ, Scitaminaceæ, Araceæ, and Alismaceæ, among Monocotyledons, are the orders which produce the greatest abundance of milk. But wherever it occurs, it must not be looked upon as a peculiar secretion, but as a modification of the proper juice. The nature of this juice and the vessels through which it flows have been described under Sap. The milky fluids vary in composition in different plants: some of them are poisonous, containing active principles, as the milk of Papaveraceæ, which contains opium; others contain caoutchouc in great abundance, and the Indian-rubber of commerce is prepared from the milk of ficus elastica, and plants belonging to the orders Apocynaceæ and Euphorbiaceæ. The cow-tree yields a milk which is used as an article of diet by the natives of South America, where it grows.

6. *Oils* are secreted by plants, and are divided into two very distinct classes, the volatile and the fixed. The former are the agents which produce the various odours of plants, and can be collected by distillation from the tissues in which they are deposited. The latter exist in the cells of cellular tissue of many plants, especially the seeds, where they seem to perform the same office as starch, gluten, &c. [Oils.]

7. *Resins* are found deposited in the tissues of plants, but not in a regular manner, as they form passages and intercellular cavities in the midst of the tissues. They are occasionally found on the surface of plants, but this is rather the result of accident than a constant occurrence.

For further information on the physiology of secretion in plants and the properties of the various secretions, the reader is referred to Meyen's *Neues System der Pflanzen Physiologie;* Bischoff's *Lehrbuch der Botanik; Library of Useful Knowledge*, 'Botany.'

SECT (from the Latin *Secta*). Two accounts are given of the origin of this word. By some persons it is represented as a derivative of *sequ-or* (*secu-tus*), 'to follow.' By others it is derived from *sec-o* (*sec-tus*), 'to cut.' It is in this case, as in many similar instances, not easy to decide between the pretensions of the two; and it is far from being improbable that some persons may have used the word as a derivative from one verb, and others as derived from the other.

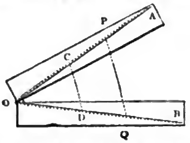
The *sects* of philosophers in antient times seem rather to have been persons who were *followers* of some distinguished teacher, than persons *cut off* from any general mass. But when we come to the word in its now more common and familiar use, namely, as denoting a particular community of Christians, the idea then predominates of *separation, cutting off*, over that of *following*. Thus no one thinks of calling the Catholic church a sect; and none, except it was designed to disparage and dishonour it, would call the English Protestant church a sect. But when we descend below it, we then see religious communities small in their numbers, and comparatively insignificant, who are *cut off* from a church, either by their own act, or by some supposed or real act of usurpation and unchristian tyranny on the part of the larger community. Thus the Quakers are a sect, the Anabaptists are a sect, the Methodists are a sect, and the Independents and English Presbyterians now are sects, though they, and especially the latter, were for some time in existence without falling under the description of a sect, being still incorporated in the church, in which they sought to accomplish certain reforms. In other systems there are similar bodies of sectaries.

SECTION, the curve made by the intersection of two surfaces. In the graphical arts it means generally a plane section, and most frequently a vertical section, the horizontal section being called the plan. In architectural designs, the longest vertical section is usually called the elevation, the term section being restricted to vertical sections which are perpendicular to the elevation.

SECTOR (Geometry), the figure made by two straight lines which meet, and a curve which cuts them both. The most common is the circular sector, made by two radii of a circle and the arc which they include. If r be the radius in linear units, and θ the angle measured in *theoretical* units [Angle], the area of the sector is $\frac{1}{2} r^2 \theta$ square units; but according as the angle is expressed in degrees and fractions of a degree, in minutes and fractions of a minute, or in seconds and fractions of a second, the area is found by the first, second, or third of the following formulæ:—

$$\frac{r^2\,\theta^\circ}{2\times 57\cdot 29578} \qquad \frac{r^2\,\theta'}{2\times 3437\cdot 747} \qquad \frac{r^2\,\theta''}{2\times 206264\cdot 8}$$

SECTOR (Drawing Instrument), an instrument invented by GUNTER, which has the appearance of a small carpenter's rule marked with scales in every part; the greater number of these scales not being laid down parallel to the edges of the rule, but converging towards the pivot on which the moving arm of the rule turns while the instrument is opened. These converging scales only properly belong to the sector; the others are merely laid down for convenience on such blank spaces as are left by the converging or sectorial scales.



The sector is a large number of pairs of compasses packed up into one, and most explanations of the instrument attempt to describe them all in one. It will however be more convenient to separate one pair of compasses from the rest, and to describe its use. Each piece of the ruler is marked with the same scales. Take one of these scales, OA, and that which corresponds to it, OB; then AOB is a pair of compasses which can be opened or shut at pleasure. Suppose two scales, say of chords, to be laid down on OA and OB, which are chords of 90°, OP and OQ being radii, or chords of 60°. If OP be four inches, we have then before us two scales of chords with the radius of four inches actually laid down, and any chords might be taken off them as from a common scale: for instance, if the marks of 35° be at C and D, then either OC or OD is the chord of 35° to a radius of four inches. But suppose it required to find the chord of 35°, not to a radius of 4 inches, but to one of 3·61 inches. We know that

$$4 : 3\cdot 61 :: \text{ch. } 35^\circ \text{ (rad. 4)} : \text{ch. } 35^\circ \text{ (rad. } 3\cdot 61\text{)};$$

and the fourth term of this proportion is to be found. Now this may be done with sufficient accuracy, and without any drawing, as follows:—Take a common pair of compasses, and open them to 3·61 on a subdivided scale of inches. Then open the sector until the points of the compasses are made to fall on P and Q, which, if the sector open rather easily, may be done very quickly. We have then PQ = 3·61 inches, and CD is the chord of 35° to that radius; for by similar triangles

$$\text{OP} : \text{PQ} :: \text{OC} : \text{CD};$$
$$\text{or} \quad 4 : 3\cdot 61 :: \text{ch. } 35^\circ \text{ (rad. 4)} : \text{CD};$$
$$\text{whence} \quad \text{CD} = \text{ch. } 35^\circ \text{ (rad. } 3\cdot 61\text{)}.$$

Take the compasses then, and fixing one point at C, make the other fall on D; the distance CD may then be transferred with the compasses to the paper, or to the scales of inches, according as construction or arithmetical estimation is required.

The scales usually laid down upon the two sides of common sectors, such as are constructed upon a foot ruler, are:

1. A line of *polygons*, marked POL., showing the sides of polygons inscribed in a circle. And since the side of the hexagon is the radius of the circle, the radius of the scale is the distance from O to the figure 6. Thus, to inscribe a polygon of ten sides in a circle of two inches radius, open the sector until 6 and 6 on the counterpart polygon scales are two inches apart; then the distance from 10 to 10 on the same scales will be the side of the figure required.

2. A line of *chords*, as above described, the radius being the chord of 60°. But it is to be noted that upon the common sector the whole length OA of the scale is only the chord of 60°, so that angles above 60° do not appear. To construct an angle of more than 60°, first set off 60° on the circle drawn by means of the radius, and take the chord of the remainder from the sector. We think that the sector might be usefully copied in this respect on the common scales: giving all the length which the proposed scale will allow, to the chord of 60°, instead of to that of 90°.

3. A line of *sines*, the radius of which is the sine of 90°. Thus, to find the upright side of a right-angled triangle having an hypothenuse of 3·41 inches, and an angle of 32°, open the sector until 90° and 90° on the counterpart lines of sines are 3·41 inches apart; then the distance from 32° to 32° on the same lines will be the side required.

4. A line of *secants*, usually extending to about 75°, the radius of course being the secant of 0°. This scale is blank from O to 0°.

5. A first line of *tangents*, from 0° to 45°, the radius being the tangent of 45°, or the whole length of the rule.

6. A second line of tangents, on a smaller scale, beginning at 45° and proceeding to about 75°, the radius being the tangent of 45°, or the distance from O to the beginning of the scale.

7. A line of equal parts for operations answering to finding a fourth proportional to three numbers. Thus to find a fourth proportional to 36, 47, and 53, make 36 and 36 on the counterpart scales fall as far apart as from O to 47; then the distance from 53 to 53 on the same scales, measured on the scale, will show the fourth proportional.

To write on the applications of the sector would be to make a treatise on graphical trigonometry: one instance may suffice. It is required to calculate the formula

$$76 \times \frac{\sin. 59^\circ}{\sin. 38^\circ}$$

On the counterpart lines of sines make 38° and 38° (by opening the sector) fall as far apart as from O to 59° on the same scale; then the distance from 76 to 76 on the counterpart lines of equal parts will show, on that line of equal parts, the numerical value of the result required. Or make 38° and 38° on the counterpart lines of sines fall as far apart as from O to 76 on the line of equal parts: then the distance from 59° to 59° on the counterpart lines of sines will show the result required on the scale of equal parts.

The sector becomes an incorrect instrument, comparatively, when a great opening is required, and also when the result is much greater than the data from which it is produced. So much accuracy of construction is necessary, that those to whom the instrument is often really useful (not many, we suspect) should rather procure the larger ones, which are manufactured by the best instrument-makers, than be content with the six-inch lines which are found in the common cases of instruments. The sector is an instrument which requires much more care than the common scales, and in the use of which expertness can be gained by nothing but practice. Each scale is a pair of parallel lines with cross divisions; and it is important to note that the compasses must be applied to the inner of the parallel lines in every case. Also when the compasses are in the hand, with one point laid on one of the scales, the other scale being about to be moved to bring the other point of the compass on the right division of the counterpart scale, take care to hold the compasses only by that leg which is laid down on the scale.

SECTOR, ZENITH. [ZENITH SECTOR.]

SECULAR, a name given to those variations in the planetary motions which are of long duration, so that their periods are better expressed in centuries than in years.

SECUNDINES [EMBRYO.]

SECUNDUS, JOHANNES, is one of the most esteemed of modern Latin poets. His verses are chiefly amatory, and modelled after Catullus, whose passionate and tender spirit he had caught, without descending to the extent of his licentiousness. Like other learned men of the age, he took a Latin name: why that of Secundus, does not clearly appear. His family name was Everts, which in other languages is softened into that of Everardi and Everard. His father Nicholas or Klaas Everts, himself a learned man, and a distinguished jurist and magistrate, had five sons, all more or less eminent, among whom however John's fame stands highest. He early showed that taste for Latin poetry to which be owes his reputation; but he adopted the law as his profession, and graduated with distinction at Bourges, in 1533. That his talents and acquirements were well known may be inferred from the archbishop of Toledo having chosen him for private secretary. Through this connection he obtained the notice and esteem of Charles V., whom he accompanied to Tunis in 1534. Unfortunately the climate of Africa sowed in him the seeds of a mortal disease; and he was fain, instead of following up his fortunes by accepting an important post at Rome, to return to his native climate only to die at Tournai, October 8, 1536, at the early age of twenty-five.

His Latin poems are—Elegies (3 books), 'Basia,' Epigrams, Odes, Epistles, Funera (elegies in the English meaning), and Miscellanies, one book each. There are many editions, among which that of Leyden, 2 vols. 8vo., 1821, is recommended. His works are published jointly with those of his brothers Nicholas and Adrian, who assumed respectively the names of Grudius and Marius, under the title *Poemata et Effigies Trium Fratrum Belgarum*. There are translations of the 'Basia' into English, French, &c. Of the former, that of 1775, with the Life of Secundus, and of the latter, that by Tissot, 1806, are said to be the best.

SECURI'FERA, a family of Hymenopterous insects of the section Terebrantia, the species of which are chiefly distinguished by their having the abdomen sessile, or joined to the thorax so as to appear a continuation of that part, and not separated by a slender peduncle. In the females, the abdomen is provided with a saw-like apparatus, which not only serves for depositing the eggs, but for preparing a place for their reception. The larvæ greatly resemble those of lepidopterous insects, and, like them, feed upon plants; they are cylindrical, soft, and fleshy; have the head vertical, and the three thoracic segments each provided with a pair of legs: besides these, the abdomen is often provided with pro-legs.

The *Securifera* are divided by Latreille into two sections, the *Tenthredinetæ* and the *Urocerata*. The first corresponds with the genus *Tenthredo* of Linnæus, the species of which have the mandibles elongated and compressed; the maxillary palpi are six-jointed, and the labial have four joints; the four wings are always divided by the nervures into numerous cells. The abdomen is composed of nine segments, the last of which is provided with an oviduct composed of two serrated lamellæ; these are pointed and lodged between two others forming a kind of sheath. By means of this saw-like ovipositor the female Tenthredo bores holes in the stems and other parts of plants, in which she deposits her eggs. In each hole, after the egg or eggs are deposited, a liquid is injected, the use of which, it is supposed, is to prevent the closing of the opening. The wounds thus made increase in volume, and form excrescences, which are either hard, or soft and pulpy, according to the nature of the plant or of the part wounded. These tumours then form the domicile of the larvæ, which inhabit them either solitarily or in society, and in them undergo their metamorphosis. Generally however the larvæ of the Tenthredinidæ live exposed on the leaves of the plants upon which they feed, and these larvæ are usually observed with the body more or less rolled in a spiral manner. When about to assume the pupa state, they enclose themselves in a cocoon which is sometimes fixed to the plant, but frequently they bury themselves in the ground previously to assuming the pupa state.

The second section (*Urocerata*) is distinguished from the preceding by the mandibles being short and stout, the ligula entire; the ovipositor of the females is sometimes exserted and composed of three slender appendages, and sometimes spirally rolled within the abdomen. It is composed chiefly of the Linnæan genus *Sirex*.

SEDAINE, MICHEL JEAN, born at Paris, July 4, 1719, died May 17, 1797, was a dramatic writer of considerable merit. On the death of his father, who was an architect, he was reduced to follow the trade of stone-mason. He continued however to study, and casually attracted the notice of his employer, an architect named Buron, who, on discovering his talents, gave him instruction, and finally took him into partnership. This service he afterwards repaid by educating the painter David, who was Buron's grandson. Sedaine made his first appearance as a dramatist in a piece taken from the 'Devil on Two Sticks,' played at the Opera Comique in 1756, which was very popular. After writing for that theatre during several years with brillant success, he took a bolder flight, and brought out his 'Philosophe sans le Savoir,' on the more classical stage of the Comédie Française. This, which is esteemed his most sterling piece, had a great run. He also wrote for the Grand Opéra; and thus, it has been observed, shone at once on three of the chief theatres of France. The well-known opera of 'Richard Cœur-de-Lion,' for which, and many other of Sedaine's works, Gretry composed the music, procured for him, at the age of sixty-five, admission to the Académie Française.

Gaiety, originality, truth of dialogue, and skill in raising and sustaining interest in his plots, are the merits ascribed to Sedaine as an author. His style is censured for negligence, but it is forcible and flowing, and well adapted to his usual melodramatic composition. He himself maintained that what were called his faults really contributed to his success. 'They will have it,' he said, 'that I can't write French; and I say that none of them could write "Rose et Colas."' This was said in mortification at having been left out of the Institut National, when the pre-existing *Académies* were remodelled into that body. The catalogue of his plays amounts to thirty-two. There is a selection ('Œuvres Choisies de Sedaine') with a memoir, Paris, 1813.

SEDAN, a town in France, in the department of Ardennes, 157 miles from Paris, through Soissons, Reims, and Mézières. In the ninth century Sedan was the subject of a struggle between Charles the Bald and Louis of Germany; and in the course of the middle ages the lordship of Sedan was erected into a principality, which, after various changes, was united to the crown of France in the reign of Louis XIII. That prince deprived the town of its municipal franchises, a step which much depressed it; but it was revived by the protection of Colbert. The Protestants had an academy here, which continued down to the revocation of the Edict of Nantes.

The town is seated on the Meuse, in a district not remarkable for fertility, but well cultivated in fields and kitchen-gardens. It is fortified; but the fortifications, with the exception of the citadel, are not well kept up. The town consists of two parts, the upper and lower town, and has wide straight streets, lined with houses of respectable appearance, roofed with slate. The old castle, remarkable as the birth-place of Turenne, is occupied as an arsenal, in which are kept some fine and curious specimens of antient armour. There is a handsome bridge over the Meuse, which flows through the town; and there are a Roman Catholic church and three chapels, a Reformed church, and an establishment of the Sisters of Charity. There are three barracks, one of them for cavalry, very spacious and handsome. The military hospital has accommodation for 500 patients, and an extensive garden attached to it. It is on an elevated spot, well fortified, and commanding the whole place. There are a foundling hospital, a college, a drawing-school, a public library, a prison, and a theatre. A bronze statue of Turenne adorns the place or square of the town-hall.

The population, in 1831, was 13,661; in 1836 it was 13,719. The town is celebrated for its manufacture of fine woollen cloths, a branch of industry which was established here in the seventeenth century, and fostered by the patronage of Louis XIV., at the instigation of Colbert. Black cloths are chiefly made now. Kerseymeres and other woollens are also made. Woolcombers' cards and tools, and machines for shearing the cloth, are manufactured. To these articles may be added woollen yarn, woollen hose, and steel buckles. Trade is carried on in a variety of articles besides these; and there are tan-yards and dye-houses. Four fairs are held in the year. There are numerous iron-works in the surrounding district.

The arrondissement of Sedan comprehends 93 communes, and is divided into five cantons or districts, each under a justice of the peace.

There is a canal cut from the Meuse above the town, and carried through the ditches which surround the fortifications into the same river below the town. It has a small dock for the canal boats, and is provided with sluices at the extremities where it unites with the river. It was commenced in 1789, but was not finished till 1810, the works having been suspended from 1792 to 1806.

SEDATIVES are agents which produce a direct depression of the action of the vascular system, with little sensible evacuation. They differ from narcotics, inasmuch as their depressing effects are not preceded by any obvious excitement or increased action of the heart and arteries. Whether they act primarily on the heart itself, or secondarily by a previous influence on the nervous system, is not clearly ascertained. Some, such as the infusion of tobacco, and hydrocyanic acid, appear to destroy completely the sensibility of the heart, so that it no longer responds to the stimulus of the blood; but how this effect results is altogether unknown. Oxalic acid, when the dose is large, seems also to paralyse the heart; while in less quantities it operates differently. [OXALIC ACID.] The peculiar mode of action of the articles entitled to be considered as pure sedatives has been detailed under the respective heads of DIGITALIS, HYDROCYANIC ACID, NICOTIANA, &c., and need not be repeated here. The medical employment of these formidable agents should never be had recourse to without competent authority and superintendence; but as many cases of poisoning result from their accidental or criminal administration, it is needful to observe that the greatest promptness is requisite in the administration of appropriate remedies. Vital stimulants, such as ammonia and brandy, are the best; and electricity or galvanism may be resorted to after the others.

Sulphuretted hydrogen, when breathed, injected into a vein or the rectum, or even applied to the skin, acts as a sedative, and in a small quantity can occasion death. It is largely disengaged from many decomposing substances, such as exist in stagnant pools, ditches, drains, and cesspools. Proximity to these produce effects more or less serious according to the intensity of the gas. Even one of its compounds, hydro-sulphuret of ammonia, is a potent sedative. Cold, when extreme, likewise acts as a sedative, but its mode of action has been already explained under Bathing.

SEDBERG. [Yorkshire.]

SEDENTARY ANNELIDS, Lamarck's third order of his ninth class, *Annelids*. The following is his definition of this third order:—

Animal always inhabiting a tube, out of which it never comes entirely, and without eyes. *Branchiæ* always at one extremity of the body or near it, unless the tube of the animal is open on one side throughout its length.

Lamarck divides this order into three divisions:—

1. Those whose branchiæ are dorsal or disposed longitudinally on the body.

Dorsalians.

This division comprises the following genera, *Arenicola* and *Siliquaria*. [Tubulibranchiata.]

2. Those whose branchiæ, either known or supposed, are disposed at one of the extremities of the body or near it.

(*a*) Branchiæ not determined, supposed to exist at the posterior part of the body. Tube of the animal open at both ends.

Maldanians.

These consist of the genera *Clymene* and Dentalium.

(*b*) Branchiæ in general known, disposed on the anterior part of the body or near it.

(+) Branchiæ not separated nor covered by an operculum.

Amphitritians.

These are thus subdivided:—

(1.) Branchiæ short, never jutting out (avançées). Tentacula short or null. This subdivision comprises the genera Pectinaria and *Sabellaria*.

(2.) Branchiæ or tentacula of considerable size, jutting out anteriorly, either in a tuft (aigrette) or in a flabelliform plume (panache). This subdivision consists of the genera *Terebella* and *Amphitrite*. [Tubicolidæ.]

(++) Branchiæ separated or covered by an operculum. Tube solid and calcareous.

Serpulaceans.

Under this division Lamarck arranges the genera *Spirorbis*, *Serpula*, *Vermilia*, *Galeolaria*, and Magilus. [Tubicolidæ.]

SEDGE-WARBLERS. [Sylviadæ.]

SEDGEFIELD. [Durham.]

SEDLEY, SIR CHARLES, an English poet, was the son of Sir John Sedley of Aylesford in Kent. His mother was Elizabeth, daughter of Sir Henry Saville, warden of Merton College, Oxford. At the age of 17, in the year 1655-6, he became a fellow-commoner of Wadham College, and taking no degree, retired to his own county, where he lived till the restoration of Charles II. After this event he came to London, and, to use the words of Antony à Wood, set up for a satirical wit, a comedian, poet, and courtier of ladies. In 1663 he was fined very heavily for a drunken frolic in which he had been engaged, the particulars of which are quaintly told by Wood. (*Athenæ Oxon.*) Shortly after this he represented the borough of New Romney in Kent. Several of his speeches in parliament are printed among his works.

During the reign of James II., Sedley appears to have retired from the court, which he had much frequented in the lifetime of Charles. At the Revolution he joined the party of William. He died August 20, 1701.

Sedley's works, with a short memoir prefixed, were published in 1722. They consist of various short amatory poems, a few speeches in parliament, translations from the classics, and the following plays: 'The Mulberry Garden,' a comedy; 'Antony and Cleopatra,' a tragedy; 'Bellamira, or the Mistress,' a comedy. ('Tunbridge Wells, or a Day's Courtship,' a comedy; 'The Tyrant King of Crete,' a tragedy; 'The Grumbler,' a comedy, are also attributed to him.)

As a poet Sedley has been well characterized by Lord Rochester's celebrated lines beginning—'Sedley has that prevailing gentle art.' In unaffected simplicity and ease of expression, in sprightliness of fancy, in the skilful treatment of common and trivial subjects, he is surpassed by none of his contemporaries. His licentiousness is of a very refined kind, and his pages are not disfigured by the grossness of language so common in his time. The best of his short poems are printed in Ellis's 'Early English Poets.' His plays have very little merit. For his Life, see Wood, already quoted; a Memoir prefixed to the edition of his works, 1722; and Hasted's 'History of Kent,' vol. i.

SEDLITZ, a village in the circle of Saaz in Bohemia, about a mile from Seidschuz, with two bitter salt-springs, which were discovered in 1724 by Frederick Hoffmann, physician of Halle, and from which the well-known salt is obtained. There are several such springs in the neighbourhood, including those at Seidschuz, in the circle of Leitmeritz. They are mostly situated round the great Serpina Marsh, to which they perhaps owe their origin. This marsh, which is nearly five miles from north to south, is often for half the year under water, and in dry weather is used as a meadow; pits are then dug in it, from which bitter salt is obtained. Above half a million of bottles of the water of Sedlitz and Seidschuz are annually sent to all parts of Germany.

SEDUCTION. [Parent and Child.]

SEDU'LIUS, CÆLIUS, a Christian Roman poet, is generally supposed to have lived during the first half of the fifth century of our æra; but who he was and where he lived is unknown. Some writers call him a presbyter, others an antistes, and others again call him a bishop. A few very late writers state that he was a disciple of Hildebert, archbishop of the Scots, and that he came from Scotland or Ireland to France, and thence to Italy. But these statements are either entirely groundless, or arise from the circumstance that the old Christian poet Sedulius was confounded with another Sedulius who lived in the eighth or ninth century of our æra.

There are four poems which are usually ascribed to Sedulius:—1, 'Mirabilium Divinorum, sive Operis Paschalis Libri (quatuor) Quinque:' it is preceded by a prose letter to an abbot Macedonius, from which we learn that the poet treated of the same subject in prose also, and that he himself divided the poem into four books, though in all our editions it is divided into five books. Whether the fifth book was added by Sedulius himself at a later period of his life, or whether it was added by some one else, is uncertain. The poem, which is in tolerably good hexameters, contains some portions of the history of the Old Testament and the life of Christ. The language is purer than that of many of his contemporaries, and in some passages it is really poetical. 2, 'Collatio Veteris et Novi Testamenti.' This poem is written in elegiac verse, and in such a manner that the first words of every hexameter form the second half of the pentameter which follows. It contains narratives from the Bible, so arranged that those taken from the Old Testament always appear in juxta-position with those taken from the New Testament. 3, A 'Hymnus,' written in Iambic dimeters, in which the verses of each stanza begin with the letters of the alphabet in their usual succession (Acrosticha). It is a panegyric upon Jesus, and one of the best productions of the Christian poetry of the age. 4, 'De Verbi Incarnatione' is composed of verses taken from Virgil, which by slight alterations are combined into a Christian poem.

The editio princeps of Sedulius is the 'Ascensiana,' Paris, 4to., without date. The latest editions are by Cellarius, Halæ, 1704 and 1739, 8vo.; by J. Arntzen, Leuwarden, 1761, 8vo.; and by Faustino Arevalo, Rome, 1794, 4to.

Comp. Bähr, 'Die Christlichen Dichter und Geschichtschreiber Roms,' p. 54, &c.

SEDUM, a genus of plants belonging to the natural order Crassulaceæ. It is known by possessing a 5-parted calyx with ovate, usually turgid, leaf-shaped sepals; five petals, which are usually spreading; ten stamens, an hypogynous scale at the base of each carpel; five carpels. They are mostly herbs or shrubby plants, with stems usually branched from the base. The flowerless stems are crowded with leaves, which are alternate, seldom opposite, fleshy, terete or flat, and entire. The flowers are commonly yellow, sometimes white or blue, and are arrayed in cymes. The species of

Sedum are inhabitants of the temperate and warmer parts of the earth, and are mostly found in dry, barren, rocky, or arid situations where nothing else will grow. Their roots appear to serve only the purpose of holding them in the ground, whilst their leaves are so constructed that they absorb moisture from the air, and prevent its being again evaporated. It is thus that they are fitted for the situations which they occupy. G. Don, in Miller's 'Dictionary,' enumerates 110 species of this genus. Many of them are British, and a number of the foreign species are cultivated in our gardens. We shall describe a few as examples of the genus.

Sedum Rhodiola, Common Rose-root, or Rhodiola: leaves flat, oblong, serrated at the apex, glabrous, glaucous; root tuberous; stems single; flowers with four petals, eight anthers, and diœcious from abortion. It is a native of mountainous districts of the middle of Europe, of Siberia, and North America. In Great Britain it is found on mountains in the north of England, Scotland, and Wales. It is a glaucous plant with yellow flowers. The root, when dried, has a sweet taste and smell, and hence its common name. The leaves have been used as a cataplasm in headache, and the root has been supposed to possess antiscorbutic qualities. In Greenland it is eaten as a salad. This and some allied species constituted the genus Rhodiola, but the difference between them and Sedum does not justify the separation.

Sedum Telephium, Orpine, or Tuberous Stonecrop: leaves oblong or oval, attenuated at the base, flat, toothed, glabrous; stems erect; cymes corymbose, terminal; stamens equal in number with the petals. It is found on rocks, walls, and dry stony places in most parts of Europe: in Great Britain it is met with on the borders of fields, in hedges and bushy places, on a gravelly or chalky soil. Several varieties have been described, and sometimes as species. The most frequent is one with purple flowers, *S. T. purpureum*. The leaves of this plant are sometimes eaten as a salad; and in former times the roots were in request as a remedy in hæmorrhoids and other diseases.

Sedum Anacampseros, Anacampseros, or Evergreen Orpine: leaves wedge-shaped, obtuse, entire, nearly sessile, alternate, flat, smooth; stems decumbent; flowers corymbose. It is a native of rocks on the higher mountains of Piedmont, Savoy, Switzerland, &c. It is often cultivated in gardens. It is a trailing plant, with beautiful purple flowers. It was also formerly used in medicine.

Sedum acre, Acrid Stonecrop: stems rather creeping; branches erect; leaves ovate, sessile, suberect, alternate, glabrous; flowers sessile, on a trifid cyme; petals lanceolate, acuminated. It is one of the most common of the genus, and is found on walls, roofs of houses, rocks, and dry places, all over Europe. When chewed in the mouth, it has a hot biting taste; hence it is frequently called Wall-pepper. When applied to the skin, it produces vesication; and, taken internally, it causes vomiting. It was formerly much used as a remedy in those skin diseases which are vulgarly called scorbutic, but it is not often used now in this country.

Sedum album, White Stonecrop: branches perennial, rooting; leaves club-shaped, green, flattish, glabrous; cymes branched, terminal, subcorymbose; petals bluntish. The flowers are cymose and white. It is a native of Europe, in dry meadows, on walls and rocks. It is rare in England. With many of the more common stonecrops, this species has been used in medicine, and also eaten cooked, or as a salad.

In the cultivation of the species of Sedum, they will be found to succeed best on rock-work, for which their habit especially adapts them. The perennial species may be readily increased by cuttings. Those which are annual can be raised by merely sowing the seed in the situations where they are to grow. Those which require a greenhouse may be sown in pots filled with sandy loam and brick rubbish, which should be well drained. Cuttings should be allowed to dry a few days before planting, in order to prevent rotting.

SEED, in Botany, is that part of a plant which contains, within several coverings, the embryo or young plant, and is itself covered over with the various parts of the pericarp or fruit. The seed in its young state is called the ovule [OVULE], which is found in the interior of the ovary, or germen, at a very early period of its growth. When the ovules are first seen, they are like little warty excrescences on the inside of the ovarium, composed of delicate cellular tissue. As they increase in size they elongate, and may then be divided into two parts, a central portion, consisting of cellular tissue, called the *nucleus*, and an external covering consisting of two membranes, the outer one of which is called *primine* and the inner one *secundine*. At one end the two membranes are open, forming a hole called the *foramen*, from which the nucleus projects more or less in the early stages of its growth. As the ovule increases in size, the foramen is almost closed, and in the matured seed it is called the *micropyle*. The base of the ovule is attached to a membrane of the ovarium called the placenta, and as the ovule increases in size the portion of its tissues that connects it with the ovary becomes, relatively to the ovule, small and cord-like, and hence has been called the *funiculus* or *umbilical cord*. The point where this cord unites with the ovule becomes in the seed the *hilum*, and it is at this point also that a number of spiral vessels and ducts are observed to pass to the base of the seed, which has been called the *chalaza*. In the progress of the growth of the ovule the nucleus increases in size, and becomes hollow inside, forming a little shut sac, which forms a kind of third membrane, called *tercine*. In the interior of this sac another is formed, which, as it contains or forms a part of the embryo or young plant, is called the *sac of the embryo*. Whilst growing, the parts do not always maintain the same relations to each other that we have described, and from this circumstance Mirbel has proposed a classification of ovules. When the ovule has grown regularly with the hilum and chalaza at the base and the foramen at the apex, it is called a *straight* ovule, or *orthotropous*. Although this appears to be the normal mode of growth, it is not the most frequent. It is seen in the walnut. If in the course of growth the ovule is bent round, so that the foramen is brought near to its base, where the hilum and chalaza exist, it is called a *curved* ovule, or *campylotropous*. This is seen in the Brassicaceæ, Papilionaceæ, and Caryophyllaceæ. When one part of the ovule grows faster than the other, the nucleus loses its relative position,—its point is in this instance directed towards the base, and the foramen is found near the hilum, and the base of the nucleus becomes situate where its apex originally was, and it carries to this point the chalaza, which is continued from the cord by means of a set of vessels called the *raphè*. This forms a third class of ovules, called *contorted* ovules, or *anatropous*. It is seen in Liliaceæ, Rosaceæ, Ranunculaceæ, &c. Mirbel maintains that all ovules are originally straight, but Link doubts this. (Link, *Grundlehren der Kräuterkunde*, theil ii., p. 281.)

The position of the ovule in relation to the ovary is a point of some importance in systematic botany. When it arises up from the base of the ovarium, it is called *erect;* when it originates a little above the base, *ascending;* when it hangs from the apex of the cavity, *pendulous;* when it hangs from any point below the very apex, *suspended*.

Their number is also a point of value, and when there are only few and easily counted, they are said to be *definite*. When their number is too great to be counted, they are called *indefinite*.

Such is the state of the young seed up to the time of the influence of the pollen upon the stigma. Soon after this action takes place a minute vesicle makes its appearance on the summit of the inner sac of the nucleus. This vesicle increases in size, and is developed into three parts, a descending portion, called the *radicle*, and which always points to the foramen; an ascending portion, the *plumule;* and lateral or enveloping portions, the *cotyledons:* the whole constituting the *embryo* or young plant.

Whilst the embryo is growing, the membranes which immediately surround it increase in size, and frequently become the seat of the deposition of a large quantity of amylaceous matter called *albumen*, which is deposited for the purpose of supplying the young plant with nutriment during its growth. The albumen however is not always deposited around the embryo, but in many cases is deposited in the cotyledons of the embryo itself, where it performs the same functions as when deposited in the tercine, or sac of the embryo. The former takes place in Ranunculaceæ, Papaveraceæ, and all that group of plants named by Lindley Albuminosæ, whilst the latter is seen in Leguminaceæ and other orders.

When the embryo is fully grown, the ovule has no further need of connection with the placenta, the funiculus or cord therefore dries up, and the scar which is left on the seed at its point of union with it is the hilum or eye; and when this is fully formed, and the embryo is capable of independent growth, the ovule becomes a seed. Sometimes the umbilical cord, instead of disappearing, increases in size, forming a membrane which entirely envelopes the seed, which is called an *aril*. One of the most remarkable instances of its existence is in the nutmeg, around which a thick aril is formed, which forms the mace of the shops. It is also well seen in the Euomymus, or common spindle-tree, where it forms a beautiful orange-coloured mantle around the seed. It also exists in the passion-flower. Its uses are unknown.

The external coverings of the seed, which are called primine and secundine in the ovule, are called the *testa*, *perisperm*, or *spermoderm*, and are nothing more than a hardened state of the ovular membranes. Whatever may be the number of these coverings in the ovule, they are seldom discernible in the seed. In the walnut however two integuments can be plainly seen, one brown and tough, the other light and filmy; also in the almond and some other seeds. In most instances the testa of the seed is perfectly smooth, but in others it is covered over with hair and other appendages. The cotton that is so extensively used for the manufacture of clothing is the production of the outer covering of the seeds of the cotton-plant. The oleander is supplied with hairs at a particular part of the plant, that facilitate the moving of the seed from place to place through the air. In some instances the seeds have broad membranous expansions of the testa, called *wings*, by which means they fly from one spot to another, as in the Bignonia. Many seeds are beautifully marked with veins running in all directions; others have minute elevations and depressions, presenting a remarkable regularity and beauty of structure.

When the seed is stripped of its testa, it presents either the albumen surrounding the embryo, or the embryo itself. When the albumen is present, it varies much in character, being of a horny, oily, fleshy, or mealy consistence. These differences depend on the nature of the peculiar secretions which are mixed with fecula, or starch, in the albumen. There is a peculiar form of the albumen, which is called *ruminated*, and which takes place in consequence of the abstraction of certain parts by absorption and their not being again filled up. This is the case with the nutmeg.

There is sometimes found in seeds an organ between the albumen and embryo, which is the innermost membrane, in a state of induration and increased in size; it occurs in all the species of the ginger tribe, and also in Nymphæa lutes, the yellow water-lily. It is called the *vitellus*.

The embryo is the most internal of all the parts of a seed. It consists, as before stated, of the radicle, plumule, and cotyledons, to which some add the *cauliculus*, or neck, which is only the point at which the radicle and plumule meet. The *direction* which the embryo takes varies much in different orders and genera of plants. Its directions are divided by botanists into *absolute* and *relative*. The absolute directions are explained by the terms straight, curvate, falcate, uncinate, coiled up, folded up, spiral, bent at right angles, and serpentine. Terms have been devised also to express the relative positions of the embryo; but it is much more general for botanists to use the terms which we have referred to in speaking of the form of the ovule, and therefore we shall not explain these. For further information on the structure and functions of the embryo see COTYLEDON and GERMINATION.

The seed-like fruits of Lamiaceæ, Boraginaceæ, Gramineæ, and Cyperaceæ were supposed by Linnæus and his followers to be *naked seeds*. But as these have been discovered to possess a pericarpial covering, it was thought that naked seeds could not exist. This opinion however has been shown by Brown to be incorrect, as he has demonstrated that the seeds of Coniferæ and Cycadaceæ are from their youngest state destitute of pericarp, and receive impregnation through their integuments, without the intervention of style, stigma, or stigmatic surface.

SEETZEN, ULRICH JASPAR, was born on the 30th of January, 1767, at Sophiengroden near Jever. His father was in good circumstances, and gave his son an excellent education, which was commenced at Jever, and completed in the university of Göttingen, where Seetzen from 1785-88 studied medicine, the natural sciences, and especially agriculture and political economy. Here he became acquainted with Alex. von Humboldt and Link, with whom he conceived the plan of travelling into distant countries which were then little known. Seetzen chose Asia and Africa as the fields of his enterprise, and was encouraged in his design by Heyne, Gatterer, Eichhorn, and Blumenbach. After the completion of his studies, he returned to Jever, and made several journeys through Germany and Holland. He however never lost sight of the great object of his life, and studied with great care what had then been written upon Asia and Africa. After he had made all the preparations which private study enabled him to make, he applied to Blumenbach for his advice and support. This great naturalist recommended Seetzen to Baron von Zach, who, though at first not favourably disposed towards the extensive plans of Seetzen, soon altered his opinion, and not only instructed the young man in astronomy, but induced the Duke of Gotha to provide Seetzen with the necessary instruments for making astronomical observations, and afterwards also to grant him an annual sum for the prosecution of his objects. It was also resolved that a museum should be formed at Gotha, and the duke entrusted Seetzen with considerable sums to purchase any interesting objects connected with the arts, religion, and literature of the countries through which he was about to travel. On the 13th of June, 1802, Seetzen set out from Jever, accompanied by a surgeon who had been educated at Göttingen at the expense of Seetzen himself. The proposed subjects of his inquiry in Asia and Africa were natural history, statistics, agriculture, commerce, the arts, mathematical, physical, and antient geography, and archæology; in fact, everything that might contribute to an accurate knowledge of the countries. Seetzen stopped for a short time at Vienna, to learn the art of drawing plans and maps; and thence he went, by way of Bucharest and across the Balkan to Constantinople, where he arrived on the 12th of December. After a stay of six months, which were spent in various preparations, he crossed over into Asia Minor, and travelled by land to Smyrna. *Here* his companion was taken ill, and he was obliged to leave him behind. Seetzen continued his journey to Haleb with a caravan, and arrived there towards the end of 1803, and stayed for nearly fifteen months, which he devoted to the study of Arabic. From Haleb he proceeded to Damascus, through Syria and Palestine, as far as the deserts of Arabia, and got much new information, and made valuable collections. In 1805, he returned to Damascus; and, dressed in the costume of a Turk, he made excursions into Libanus and Antilibanus. The year after, he began his travels in the country east of Hermon, the Jordan, and the Dead Sea. His journeys in these districts were made under the greatest privations and dangers; but they were amply rewarded by the discovery of the ruins of several antient towns, the site of which had till then been unknown to Europeans. He also penetrated farther south along the eastern shore of the Dead Sea, and he proceeded around the southern shore to Jerusalem. From this place he travelled to Joppa, and thence by sea to Acre, where he remained till the end of the year 1806. We now lose sight of him for some months, as the documents belonging to that period are missing; but in March, 1807, we find him again at Jerusalem, from which place he travelled to Hebron, Horeb, Sinai, then back towards the north, and across the isthmus of Suez to Cairo, where he remained for two years. Here he purchased for the museum of Gotha a collection of 1574 MSS., 3536 archæological subjects, and collected a great many specimens in mineralogy, botany, and zoology. In 1808 he visited the province of Faioum, and examined the pyramids, the catacombs near Saccara, and the great lake of Birket-el-Karun. About this time he adopted, at least externally, the Mohammedan religion, in order to gain the confidence of the Egyptians and the Arabs, and to be able to visit those places in Arabia to which Mussulmen alone have access. He then attempted to proceed to Acaba, but was obliged to return to Suez. Soon afterwards however he travelled by sea to Yambo and Jidda, and thence to Mecca and Medina. In the two last places he made a great many drawings and plans. In March, 1810, he set out for Mocha. A letter, dated Nov. 17, 1810, and addressed to Mr. Lindenau of Gotha, was the last account that he himself sent to Europe. In 1815, Von Hammer of Vienna was informed by Mr. Buckingham, in a letter written at Mocha, that Seetzen had suddenly died in 1811, in the neighbourhood of Taes, while he was on his way to the Imam of Sana to recover his luggage, &c., which had been seized at Mocha, and that it was generally believed that the unfortunate traveller was poisoned by the command of the Imam. A report which was afterwards brought over to this country from Bombay, agreed in the main points with that of Mr. Buckingham.

The diary of Seetzen's journeys, and his maps, plans, and drawings, were for some time supposed to be lost, but nearly the whole has been recovered, and is now in the hands of Professor Kruse of Dorpat. As the editing of the immense mass of materials would be too much for one man, it has been divided into three sections, each of which is entrusted to a competent person. Kruse has undertaken the part belonging to antient geography; Senkoroski, all that relates to Arabia; and Brandis, the astronomical part, together with mathematical geography. It is intended to supply, in the form of commentaries, that which Seetzen himself might probably have added to his notes and sketches. Nothing has yet been published, so far as we are aware.

A full account of the life and travels of Seetzen is given in Brockhaus's *Conversations-Lexikon*.

SE'EZ. [Orne.]

SEFA'TIANS, a sect of Mohammedans, who hold the opposite opinion to the Motazelites, with respect to the eternal attributes of God, which they affirmed, making no distinction between the 'essential attributes' and 'those of operation;' hence they were called Sefatians, that is, 'attributists,' from *sefát*, a word meaning in Arabic 'qualification, attribute.' At first their doctrines were similar to those of other Mohammedans, but in the course of time they introduced another species of 'declarative attributes,' or such as were necessarily used in historical narration, as the hands, the eyes, &c., which they did not attempt to explain, but contented themselves with saying they were in the Law. At length, by introducing various interpretations of these 'declarative attributes,' they divided into several schools or sects, as the Asharians, or the followers of Abú-l-haran Al-ashari, who allowed the attributes of God to be distinct from his essence, yet so as to preclude any compassion between Him and his creatures; the Mushabbehites, or Assimilators, who admitted a resemblance between God and his creatures, supposing Him a figure composed of members or parts, either spiritual or corporal; the Keramians, or followers of Mohammed Ibn Kerám, also called Mugassemiun, or Corporalists, who not only admitted a resemblance between God and his creatures, but declared Him to be corporeal; the Jabarians, so called from *jabr*, which signifies 'necessity, compulsion,' because they maintained that man is 'inevitably constrained' to act as he does (the last were subdivided into Pure Jabarians and Middle Jabarians, owing to some slight divergence of opinions which arose among them); the Murgians, from *raja*, 'to expect,' who maintain that the judgment of every true believer who has been guilty of a sin will be deferred till the resurrection, and that disobedience with faith cannot hurt. There are still the disciples of Mukátel and Basher, named Thaubanians, who held opinions nearly similar to those of the Murgians. (Sale's *Koran*, Preliminary Discourse, p. 164, *et seq.*)

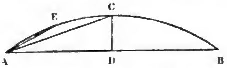
SEFFAVEAN DYNASTY. [Persia—*History*.]

SEFI DYNASTY. [Persia—*History*.]

SEGELMESA. [Marocco.]

SEGESTAN. [Seistan.]

SEGMENT (part cut off), a term which, in its general sense, needs no explanation. It is, in mensuration, most frequently applied to the part cut off from a circle by a chord, and the measurement of this segment of a circle is the only point for which reference is likely to be made to the word. Let AB be the segment of a circle, and C and D the middle points of its arc and chord. The segment ACB is easily expressed by the angle which the arc subtends at the centre: if this angle (measured in theoretical units [Angle]) be θ, and the radius r, the number of square units in the segment is



$$\frac{r^2}{2}(\theta - \sin.\ \theta).$$

But when a segment is actually to be measured in practice, it usually happens that the radius is not given, and the circle is too large to measure it conveniently. In that case the middle point C must be found, and AB and AC must be measured, as also CD. This being done, the length of the arc AB can be found with great exactness from the formula 'one-third of the excess of eight times AC over AB,' or $\frac{1}{3}(8\,\text{AC} - \text{AB})$. This formula errs only about one foot out of 80 (always giving the arc a little too small) in a whole semicircle, and the error diminishes nearly as the fourth power of the arc: thus at half a semicircle the error is about one foot out of $2^4 \times 80$, or 1280 feet; at one-third of a semicircle it is only about one foot out of $3^4 \times 80$, or 6480 feet, and so on. Another formula of the same sort, but so close to the truth that no measurements could ever be taken in practice sufficiently exact to make its accuracy appreciable, is the following:—find E the middle point of AC, and measure AE; then the arc is very nearly (but a little less than)

$$\frac{\text{AB} + 256\,\text{AE} - 40\,\text{AC}}{45}.$$

The error here is less than one foot out of 390 on the whole circle, and diminishes with the sixth power of the arc.

Taking the arc from one or other of these methods, the area of the segment is then to be found as follows:—Determine R, the radius, from $\text{AC}^2 \div 2\,\text{CD}$, and compute

$$\frac{\text{R} \times \text{Arc} - \text{AB}\,(\text{R} - \text{CD})}{2},$$

which gives the area required. This formula may be reduced to

$$\frac{\frac{1}{3}\,\text{AC}^2\,(2\,\text{AC} + \text{AD}) - \text{AD}^3}{\text{CD}}.$$

Thus (to take an instance of Bonnycastle's) if AD = 12, AC = 13, whence CD = 5 (all feet), we have for the area of the segment

$$\frac{\frac{1}{3} \times 169 \times 38 - 1728}{5} = 82{\cdot}533 \text{ square feet.}$$

Another approximate rule is (giving somewhat too little)

$$\frac{\text{CD}\,(12\,\text{AD} + 8\,\text{AC})}{15},$$

which is more exact than the preceding. The error is only one per cent. when the segment is a semicircle, and it diminishes with the seventh power of the subtended angle nearly.

It answers well enough for rough purposes, and particularly when the segment is small, to consider the arc of the circle as being part of a parabola, and to take two-thirds of the rectangle under AB and CD for the area.

SE'GNERI, PA'OLO, born in 1624, at Nettuno in the Campagna of Rome, studied at Rome under the Jesuits, and afterwards entered that Order. He applied himself more particularly to sacred oratory, and became a distinguished preacher. He formed a style of his own, avoiding both the dryness of his predecessors and the turgidity of his contemporaries, and he is one of the few really eloquent preachers that Italy has produced. (Maury, *Essai sur l'Eloquence de la Chaire.*) Segneri's 'Quaresimale,' or series of sermons for Lent, is still read with pleasure and profit. The author is rather too fond of figures and antithesis; at times he indulges too much in profane and even mythological erudition, in doing which he conformed to the vitiated taste of his age, which is known as that of the Seicentisti, but he is one of the purest writers of that age, and his language has been approved by the Crusca Academy. Segneri was an earnest and truly Christian preacher. In that vocation he visited almost every corner of Italy, and he always won the attention and affection of his audience. He composed also 'Laudi,' or prayers in verse, of an easy and popular style, to be sung before and after his sermons.

Pope Innocent XII. chose Segneri for his own preacher, as well as of the College of Cardinals, in which office he continued three years, until 1694, when he died at Rome. He was succeeded by father Casini, who nearly equalled him in eloquence, and surpassed him in the boldness and freedom with which he spoke truth, however unwelcome it might be to men in power, which however did not prevent pope Clement XI. from making him a cardinal.

Segneri composed, besides his sermons, several pious tracts, such as 'Il Cristiano Istruito,' which contains many excellent precepts for living a Christian life.

(Corniani, *Secoli della Litteratura Italiana;* Maffei, *Vita del Segneri.*)

SEGNI, BERNARDO, born at Florence about the end of the fifteenth century, studied the law at Padua, but afterwards proceeded to Aquila in the kingdom of Naples, where he followed the profession of a merchant. On his return to Florence after the fall of the republic, he courted the new sovereigns of the house of Medici, and found favour with duke Cosmo I., who employed him in several missions and other affairs of state. Cosmo employed him also in translating the works of Aristotle from the Greek into Italian. His translations of the Rhetoric, Ethic, Politic, and the Treatise on the Soul, are the only parts that have been published. Segni also busied himself in writing a history of his own times and country: 'Storie Fiorentine dall' anno 1527 all' anno 1555,' which he kept secret in his lifetime. In this history he speaks with the freedom of a conscientious historian, and as such he is placed among the best writers of Italy. The first part of Segni's history refers to the same period as the latter part of that of Guicciardini, both embracing the important event of the fall of the Florentine republic with this difference, that Guicciardini's is a general history of Italy, and Segni's a particular history of his native Florence. No less than three other Florentine contemporary historians have treated the same period, namely, Varchi, who wrote, in a prolix style, 'Storia Fiorentina,' from the year 1527 to 1538; Nardi, who wrote 'Istorie della Citta di Firenze,' from 1494 to 1531; and Nerli, in his general history, or rather chronicle, of Florence, 'Commentarij de' Fatti Civili occorsi in Firenze dall' anno 1215 all' anno 1537.' Segni however went farther than any of them, by continuing his narrative till the year 1555, thus embracing not only the period of the profligate sway of Alessandro de' Medici, included in the histories of Varchi and Nerli, but the subsequent and more important reign of his successor, duke Cosmo I., who was the real founder of the Tuscan dynasty, and who, by the subjugation of Siena, the last of the three great Tuscan republics, united the whole of Tuscany into one principality. Segni died in 1559.

There have been two other writers of the same family: Pietro Segni, who translated and commented on the work of Demetrius Phalereus 'On Elocution;' and Agnolo Segni, who wrote a valuable treatise, 'Della Imitazione Poetica.'

SEGO is the capital of Bambarra, a country situated in that part of Africa which is called Soodan. The town stands on both sides of the river Joliba, near 13° N. lat. and 5° W. long. Mungo Park, to whom we are indebted for all the information that we possess respecting this town, states that it properly consists of four distinct towns, two on the northern bank of the river, called Sego Korro and Sego Boo, and two on the southern bank, called Sego Soo Korro and Sego See Korro. They are all surrounded with high mud-walls; the houses are built of clay, of a square form with flat roofs; some of them have two stories, and many of them are whitewashed. Besides these buildings there are many Moorish mosques, and the streets, though narrow, are broad enough for every useful purpose in a country where wheel-carriages are entirely unknown. Park thought that this town might contain altogether about 30,000 inhabitants. The king of Bambarra constantly resides at Sego See Korro. At several places there are canoes belonging to the king for conveying people over the river. 'The view of this extensive city,' says Park, 'the numerous canoes upon the river, the crowded population, and the cultivated state of the surrounding country, formed altogether a prospect of civilization and magnificence which I little expected to find in the bosom of Africa.' As Sego is situated on a river, which is navigable for a great distance upwards and downwards, between countries of which one is rich in gold and the other in salt, which latter is a great object of trade in the interior of Africa, it may be supposed that Sego carries on a considerable commerce, which is also proved by the numerous canoes that ascend and descend the river; but we have no particular information on this point. (Mungo Park's *Travels in the Interior Districts of Africa*.)

SEGORBE (*Segobriga Edetanorum*), a town of Spain, in the province of Valencia, is situated in a fertile valley, on the banks of the river of the same name, which there receives the waters of a stream called Murviedro. It is the see of a bishop, suffragan to the archbishop of Valencia. The cathedral, which is a fine Gothic building, contained many fine paintings by Ribalta and other masters of the Valencian school, founded by Juan de Juanes, most of which however were either carried off or lost during the Peninsular War. About one mile from the town is the celebrated Carthusian monastery of Val de Christo, founded and richly endowed by the Infante Don Martin, son of Peter IV., king of Aragon. Segorbe was taken from the Moors in 1245, by James I. of Aragon, surnamed the Conqueror. It then became the capital of a considerable district, which was erected into a duchy. Its actual population is computed at 8000 inhabitants, whose chief occupation is the farming of the lands in the neighbourhood, which are exceedingly fertile, and yield all sorts of grain and fruits. It is about fifty miles from Valencia, the capital; in 39° 54′ N. lat. and 27′ E. long.

SEGO'VIA, a province of Spain, situated between those of Madrid and Valladolid. It has an area of 3650 square miles, with a population of about 200,000. The capital from which the province takes its name, is built on a rocky eminence, between two deep valleys, one of which is watered by the river Eresma, and the other by a rapid stream. It is surrounded with a thick wall, built by the Moors, and strengthened at intervals with turrets. The streets are narrow and crooked, as in most other antient Spanish towns. The cathedral, built at the beginning of the sixteenth century, by the celebrated Rodrigo Gil de Ontañon, on the model of the great church of Salamanca, is a mixture of the Gothic style and that of the *renaissance*. It consists of three naves measuring 380 Spanish feet by [illegible]. The interior is magnificently decorated; but, as in most cathedrals of Spain, the general effect is spoiled by the choir being placed in the middle of the central nave. The tower attached to it rises to the height of 330 feet. The windows of stained glass are greatly admired. The principal altar is decorated with the finest Granadan marble, and one of the chapels contains beautiful wood-carvings by the celebrated sculptor Juan de Juni. The Alcazar, or palace of the former Moorish governors, is a very remarkable building. It stands on the crest of the rock, on the declivity of which the city is built, and commands a delightful prospect over the plain. Though often modified and repaired by the early kings of Castile, who not unfrequently resided in it, as well as by Philip II., who added considerably to its outer works, it still preserves much of its original character, and contains several apartments decorated as in the time of the Moors. The great hall, which is ornamented with mosaic and arabesque work, contains the statues in wood of all the kings of Asturias, Leon, and Castile, from the eighth to the sixteenth century. Under the monarchs of the house of Austria, the Alcazar was converted into a state prison, where several people of distinction were confined at various times, and as such it has been admirably described by the celebrated author of 'Gil Blas.' Its present destination is a college for young cadets. The church of Santa Cruz, which owes its foundation to Ferdinand and Isabella, the convent of San Francisco, and the small church of 'El Parral,' which contains the marble tombs of the family of Villena, are well worth the attention of travellers. The Royal Mint, which is supposed to be one of the most antient places of coinage in the kingdom, is a very fine stone building. In former times, under the early kings of Castile, every description of money was coined at this mint, but at present it is confined to the coinage of copper money. Segovia was taken from the Moors about the year 1078, by Alfonso VI., shortly before the reduction of Toledo.

Segovia appears to have been a town of some importance under the Romans. Pliny (iii. 3) places it in the Conventus of Clunia, among the Arevaci; Antoninus, on the road from Saragossa to Merida. It contains several remains of the Roman period, such as statues, inscriptions, &c.; but the most remarkable object of antiquity is the famous aqueduct attributed to Trajan, and which the singular situation of the town, built as it is upon two hills separated by an intervening valley, rendered necessary. It begins about fifty paces from the town, extending first in a southern direction, and then to the west. Its length is 2400 Spanish feet. Its greatest height, in the spot called 'Plaza del Azbejo,' near the foot of the antient walls, is 104 feet; and in that part it consists of a double row of arches, built of large stones without mortar. Those of the lower range, forty-two in number, are sixty-five feet high, and fifteen feet wide. The upper arches, of which there are nineteen, are 27 feet high. With the exception of a few arches which crumbled down during the reign of Ferdinand and Isabella, and were immediately rebuilt at their expense, the remainder of the aqueduct may be said to be in the same state in which the Romans left it. There are two histories of Segovia: one by Lorenzo Calvete, under the title, 'Historia del Glorioso San Frutos, Patron de la Ciudad de

Segovia,' Valladolid, 1610; the other, which is more esteemed, by Diego de Colmenares, Segovia, 1637, fol.

Coin of Segovia. British Museum.

SEGUIER, PIERRE, was one of an antient and distinguished French family which, in the space of three centuries (1460 to 1789), is recorded to have had no less than sixty-eight of its members raised to the highest legal dignities of France. Pierre Seguier, one of the most eminent of them, was born at Paris in 1504. He began life as an advocate, and, after filling various high offices, was raised in 1564 to the rank of *president à mortier*, the highest grade but one in the Parisian parliament. In that capacity the parliament, having refused to register an edict for the establishment of the Inquisition, deputed him to lay their remonstrances before the king, Henri II.; and he had the distinguished honour of preventing, by the boldness and force of his arguments, the introduction of that odious tribunal into France. His speech on this occasion has been preserved. (Garnier, *Continuation of Velly*, vol. 27.) He resigned his office of president in favour of his second son Pierre, two years before his death, which happened in 1580; and it is remarkable that every one of his sons, six in number, filled some high legal office. Antoine, as well as Pierre, was *president à mortier*, and both of them enjoyed the special confidence of Henri IV.

SEGUIER, PIERRE, born at Paris, May 28, 1588, was the son of Jean, sixth son of the above Pierre Seguier, lieutenant-civil of Paris, a steady friend, like his brothers above noticed, of Henri IV., and a valuable public officer. Pierre Seguier, like his grandfather, rose through various offices to the rank of *president à mortier* in 1633, and that of chancellor in 1635. Having rendered important services to Anne of Austria during the ascendency of Richelieu, at the risk of incurring that minister's vengeance, he obtained Anne's full confidence; and, during her regency, rose to as high power and influence as a subject could well attain. At the breaking out of the war of the Fronde, he escaped narrowly with his life, in a resolute attempt to pass the barricades to the usual discharge of his official functions; and in the sequel of those disturbances, the seals of office were for a time taken from him. He was replaced in 1656, and continued chancellor till his death, January 28, 1672, maintaining through life the honour of his family as an independent, able, and enlightened magistrate. He was also a lover and encourager of art, and a man of elegant and accomplished mind. He was one of the originators, and president, with the title of protector, of the Académie Française, which, during thirty years, held its sittings at his hotel.

SEGUIER, ANTOINE LOUIS, of the same family, being descended from a brother of the first-named Pierre Seguier, was born at Paris, Dec. 1, 1726, and owed (1748) to the regard of Louis XV. to his name and family his first step in the law, namely, the office of king's advocate in the court of the Châtelet. In 1755 he rose to be advocate-general in the parliament of Paris, which office he held till the dissolution of that body in 1790, except that he resigned it in 1771, in consequence of the exile, and returned to it in 1774, on the return of the parliament. In forensic eloquence he is reputed a worthy successor to D'Aguesseau and other distinguished men of his predecessors; and his literary acquirements were first-rate. In the Revolution, he was offered and refused the post of mayor of Paris; and he lived retired until the appearance of an attack, entitled 'Seguier treated as he Deserves,' on which he took the alarm and emigrated. After sojourning in several places, he fixed his abode at Tournai, but died of apoplexy, January 25, 1792, leaving an unsullied character for integrity, and a high reputation as a judge, a lawyer, and a statesman. Several of his professional speeches and some of his writings are extant, but in no collected form.

SEGUIER, JEAN FRANÇOIS, of another branch of the same family, was born at Nismes, Nov. 25, 1703, and devoted himself early to the study of antiquities. Having formed a close friendship with the learned Scipio Maffei, during his visit to Nismes in 1732, he accompanied him in his travels, and resided with him till his death in 1755. Seguier then returned to his native place, and applied himself to the illustration of its splendid Roman remains. He displayed much ingenuity in deciphering, from the holes in the stones to which metal letters had been attached, the inscription formerly existing on the temple called La Maison Carrée, which he conceived to have been erected in honour of Caius and Lucius, the sons of Agrippa and grandsons of Augustus. Later researches have shaken this opinion. [NIMES.] Great part of his life was occupied, in concert with Maffei, in forming a collection of all known antient inscriptions: their work however was never published in a complete form. Seguier continued to labour on this subject to the end of his life, and left ready for the press a bulky manuscript, now in the king's library at Paris, which has never been printed. (*Inscriptionum Antiquarum Index absolutissimus*, &c.) He died of apoplexy, Sept. 1, 1784, leaving his library and valuable museum of medals, natural history, &c. to the academy of Nismes, on the dissolution of which the collection was made over to the public library of that place.

SEGUR, HENRI-FRANÇOIS, COMTE DE, son of the Marquis de Segur, was born in 1689, and died in 1751. His life was passed in active service, chiefly in Spain, Italy, Bohemia, Germany, and Flanders, first as colonel and afterwards as lieutenant-general in the French army.

SEGUR, PHILIPPE-HENRI, MARQUIS DE, son of the Comte Henri-François, was born Jan. 20, 1724. He distinguished himself, when very young, in the wars of Italy and Bohemia, especially at the siege of Prague: at the battle of Rocoux a musket-ball entered his breast, passed through to the back, and had to be extracted by the spine; at the battle of Laufeld, in leading his regiment to a charge after it had been three times repulsed, his arm was shattered in such a manner that it was necessary to amputate it. By two successive and rapid promotions he was made maréchal-de-camp and lieutenant-general. At Clostercamp he was pierced in the neck by a bayonet, received three sabre-wounds on the head, and was made prisoner. At the termination of the war he was appointed inspector-general of the infantry. In 1780 Louis XVI. called him to his councils as minister-of-war, and in 1783 raised him to the dignity of maréchal de France. He was war-minister during seven years, in the course of which he introduced many ameliorations into the army, in discipline, in expenditure, in the personal comfort of the soldiers, and in the management of the military hospitals. He afterwards lived in retirement till he was arrested by order of the Convention, in 1790; his furniture was sold by public auction; and at the age of seventy, infirm, mutilated with many wounds, deprived of an arm, and afflicted with the gout, he was thrown into the prison of La Force. He was deprived of his military pensions, as well as of his titles and his orders. Fortunately he had no property to stimulate the tyrants of the Revolution further, and his life was spared. Bonaparte, when first consul, set him at liberty, treated him with marked respect, and granted him a pension of 4000 francs. He died at Paris, Oct. 8, 1801, in his seventy-eighth year. His character is thus summed up by his son:—'When in power, he was guilty of no injustice; when oppressed by his country, he did not cease to love it. He was a good husband, a good father, a good general, a brave soldier, a just and wise minister, and an excellent citizen.'

SEGUR, LOUIS-PHILIPPE, COMTE DE, eldest son of the Maréchal de Segur, was born in Paris, December 10, 1753. He chose the army as a profession, and at an early age was made colonel of a regiment of dragoons. He was one of the three first Frenchmen of high rank who offered their services to the American deputies in the cause of American independence, the other two being the Marquis de la Fayette and the Vicomte de Noailles, but they were formally prohibited by the French ministry from leaving France. Though narrowly watched, La Fayette escaped, and reached America; Noailles obtained leave to go there about two years afterwards, but Segur was not permitted to leave France till May, 1782. He entered the Delaware in September, 1782, narrowly escaped being taken by the English, and with much difficulty reached the camp of the French general Rochambeau, under whom he fought till the termination of the American war. He then returned to France, which he reached in June, 1783. In the latter part of 1784 he was appointed ambassador to Russia, and arrived at St. Petersburg March 19, 1785; he was treated by the empress Catharine II. with especial favour, accompanied her in the great progress which she made from St. Petersburg to the Crimea in 1787, and retained her confidence as long as he remained at her court. He left St. Petersburg October 11, 1789, on his return to Paris.

In 1790 he was sent as ambassador to the court of Frederic of Prussia. Having returned to France, he was twice arrested by the revolutionists in 1793, but obtained his freedom by his prompt eloquence. He then retired into the country, and was obliged to have recourse to his pen for the means of subsistence. In 1798 he published his 'Théâtre de l'Hermitage;' in 1800, his 'Histoire des Principaux Evénémens du Regne de Frédéric-Guillaume II., Roi de Prusse,' 3 vols. 8vo., Paris; and in 1801, his 'Decade Historique, ou Tableau Politique de l'Europe depuis 1786 jusqu'à 1796,' 3 vols. 8vo., Paris. In 1803 he was chosen a member of the Académie Française, and about the same time was appointed grand-maître de cérémonies to Bonaparte. After the Restoration he became a member of the Chamber of Peers. In 1819 he published his 'Contes Moraux et Politiques,' 2 vols. 12mo., Paris; in 1821, his 'Histoire Universelle, Ancienne et Moderne,' 10 vols. 8vo., Paris; in 1822, his 'Pensées, Maximes, et Reflexions,' 18mo., Paris; in 1823 his 'Galérie Morale et Politique,' 3 vols. 8vo., Paris. In 1824 appeared his 'Œuvres Complètes,' 30 vols. 8vo., Paris, which in 1828 were reprinted and augmented to 36 vols. His 'Mémoires, Souvenirs, et Anecdotes,' were published in 1826, 3 vols. 8vo., Paris, an extremely amusing and instructive work, which includes three interesting periods of the Comte de Segur's life—the latter part of the reign of Louis XV. and the early part of that of Louis XVI., his voyage to America and the short time which he remained there, and the five years during which he was ambassador at the court of St. Petersburg, when the work terminates. A second part was promised, which was to include the following part of his life, but we believe it was never published. His death occurred in July, 1830.

PHILIPPE-PAUL, COMTE DE SEGUR, his son, born Nov 4, 1780, was one of Bonaparte's favourite generals; he accompanied him in the disastrous Russian campaign, of which he has written the history, 'Histoire de Napoléon et de la Grande Armée en 1812,' 2 vols. 8vo., Paris, 1825, which has passed through numerous editions. He is also the author of several other works.

SEGUR, JOSEPH-ALEXANDRE, VICOMTE DE, the second son of the Maréchal de Segur, and brother of the Comte Louis-Philippe, was born at Paris in 1756. He entered the army, and rose to the grade of maréchal de-camp, but he was more fond of pleasure than of war, and attached himself chiefly to the drama. He wrote 'Contes, Fables, Chansons, et Vers,' 8vo., Paris, 1801; 'Œuvres Diverses,' 8vo., Paris, 1819; 'Les Femmes, leur Condition et Influence dans l'Ordre Social,' 2 vols. 8vo.; 4 vols. 12mo., Paris, 1820; 'Romances et Chansons,' 18mo., Paris, 1820; besides a great number of comedies, vaudevilles, and operas, several of which are yet popular. He died July 27, 1805, at Bagnères.

SEICIRCUS. [MUSCICAPIDÆ, vol. xvi., p. 12.]

SEIGNORAGE. [CURRENCY, p. 235.]

SEIGNORY. [TENURE.]

SEIKS. [SIKHS.]

SEINE, a river of France, rising in the central parts of that country, and flowing into La Manche, or the English Channel.

The basin of the Seine is bounded on the south-east by the Côte d'Or and the heights of Langres, which unite the Cévennes with the Vosges; on the east and north-east by a range of hills running from these to the heights of Ardennes and by the heights of Ardennes; and on the north by another range, which extends from the heights of Ardennes, and terminates in Cape La Hève near Le Hâvre; on the south-west and west it is bounded by the range of high grounds which, with little interruption, connects the Côte d'Or with the mountains of Bretagne, and which is known in one part of its course as the heights of Morvan, and in others as the forest of Orléans and the hills of Beauce; and by a branch proceeding north from these to the coast of the English Channel, dividing the valley of the Toucques from that of the Rille. This basin is estimated by Lichtenstein (Malte-Brun, *Geog. Universelle*, 3rd edit., tom. iii., p. 32[illegible] at 3436 square French leagues, equal to 26,279 square English miles.

The Seine rises in the heights of Langres, on the south-eastern boundary of the basin, near the town of Chanceaux in the department of Côte d'Or, and flows north-west past Chatillon-sur-Seine, Bar-sur-Seine, Troyes, Romilly, Montereau, Melun, Corbeil, Paris, Mantes, Elbœuf, Rouen, and Le Hâvre, just below which it falls into the sea: its whole course is estimated by Malte-Brun at 470 miles. Its source is 1426 feet above the level of the sea; at Troyes it is 33[illegible] feet above the same level; at the junction of the Loing between Montereau and Melun, 184 feet; at Corbeil, 147 feet; and at Rouen, 111 feet. Its principal affluents on the right bank, in the order in which they join, are the Aube, the Marne, the Oise, and the Epte; and on the left bank, the Yonne, the Loing, the Eure, and the Rille. Of these the Marne is the longest, and is estimated by Malte-Brun at 26[illegible] miles. Next to it in length are the Oise (taking its affluent the Aisne as the principal stream) and the Yonne. The Seine and its tributaries abound in fish: the sturgeon, the salmon, the sole, the shad, the eel, the smelt, and other fish are caught in it.

The navigation commences at Méry, about nine miles above the junction of the Aube; but the stream is used for floating timber from a point much higher up. In the early part of the last century the navigation extended as far as Troyes, but owing to the giving way of the works by which the navigation was kept up, the river between Méry and Troyes ceased to be navigable. In 1805 new works were ordered by Bonaparte, in order to restore the navigation as far as Troyes; but these works were suspended on his abdication in 1814. In 1825 authority was given to renew them, and to continue them up to Chatillon, above Troyes, to which point there is evidence that the river was navigable for several centuries. The works under this last authority have been begun; we are not aware that they are completed. Of the affluents of the Seine, the Aube is navigable from Arcis-sur-Aube in the department of Aube; the Yonne, from Auxerre in the department of Yonne; the Loing, as far as it is connected with the Loing Canal; the Marne, from St. Dizier in the department of Haute Marne; the Oise, from Chauny in the department of Aisne; the Eure, from Pacy in the department of Eure; and the Rille, from Pont Audemer in the department of Eure. The Andelle, a small river which joins the Seine on the right bank a little higher up than the Eure, is navigable for about a mile; and the Courtavant, or Villenoxe, a small stream which joins it just above Joigny in the department of Aube, has been made navigable for small craft from Villenoxe. The Ourcq, a feeder of the Marne, is navigable from above La Ferté Milon in the department of Aisne; the Grand Morin, another feeder of the Marne, from above Crécy in the department of Seine et Marne; and the Aisne, a feeder of the Oise, from Château Porcien in the department of Ardennes. The navigation of the Seine and its tributaries is facilitated by the canals of Ourcq, St. Denis, and St. Martin, which connect the Ourcq with the Seine at Paris and at St. Denis, and by some short cuts; it is connected with that of the Saône and Rhône by the Canal de Bourgogne, which connects the Yonne, between Auxerre and Joigny, with the Saône at St. Jean de Losne; and with that of the Loire by the Loing Canal, which connects the Seine with the two canals of Orléans and Briare, of which the former joins the Loire just above Orléans, the latter at Briare. The canal of St. Quentin, of which the canals Crozat and of La Fère are parts, connects the Oise at Chauny with the Escaut or Schelde at Cambray in the department of Nord, and with the canal and navigation of the Somme. The canal of Ardennes is to connect the Aisne at Château Porcien with the Bar, a feeder of the Meuse; the canal of Nevernais is to connect the Yonne near Corbigny in the department of Nièvre, to which place it is designed to make it navigable, with the Loire at Decize in the same department, and another canal is to connect the Oise, by means of the canal of St. Quentin, with the Sambre: but these three canals are, we believe, unfinished.

The Seine has a generally slow current; and its sinuosities, especially below Paris, are very great, and tend to render the navigation exceedingly tedious. The boats which are used between Rouen and Paris, the distance between which towns by the road does not exceed 76 miles, usually take eight or ten days to descend the stream, and fourteen to sixteen to ascend it. The largest boats carry vast burdens; they are from 150 to 180 feet long, 25 to 30 feet wide, and draw 6 feet water. Steam-boats require two days for the descent and four for the ascent; and between Paris and Le Hâvre, four or five for the descent, and seven or eight for the ascent. The lowest bridge over the river is at Rouen, to which place vessels of 250 to 300 tons can ascend: the shifting sands at the mouth of the river, and the shoals in its bed, impede the ascent of larger vessels. The facilities afforded by this river for the supply of various articles for the market at Paris are of great importance: corn, flour, wine, hay, wool, hemp, hides, fire-wood, timber for building, coal, sandstone, millstones, and iron are brought down from the districts above the capital; while corn, flour, wine, cider, butter, fish-oil, flax, hemp, wool, pitch, resin, drugs, colonial produce, and manufactured goods are carried up from places below the city.

The scenery in the upper part of the river is tame and monotonous; but from Paris to Rouen, and still more from Rouen to the sea, it presents a more interesting appearance. The Seine is not subject to great overflows.

The official statement of the navigation of the Seine and its affluents is as follows:—

	Miles.		Miles.
Seine . . .	346	Oise . . .	98
Aube . . .	21	Aisne, affluent of the Oise . . .	70
Yonne . . .	74	Andelle . .	1
Marne . . .	215	Eure . . .	53
Ourcq, affluent of the Marne . .	22	Rille . . .	17
Grand Morin, affluent of the Marne .	8	Total	925

The navigation of the Loing, and of the Villenoxe or Courtavant, is not given here, they being considered as canals rather than rivers.

SEINE, one of the departments of France. It is of compact form, nearly circular, and is surrounded by the department of Seine et Oise. Its diameter varies from 13 to 17 miles; and its area is estimated at 184 square miles, which is about two-thirds of the area of Middlesex, the English county with which, from its metropolitan character, it may be most appropriately compared. The population in 1831 was 935,108, in 1836 it was 1,106,891, showing an increase in five years of 171,783, or about 18·5 per cent., and giving nearly 6016 persons to a square mile. In amount of population it exceeds every other department of France; and, with the exception of that of Nord (1,026,407 inhabitants), very far exceeds them; indeed in density of population it exceeds our own Middlesex in the proportion of 5 to 4, but in amount of population falls short of it. Paris is the chief town.

The surface of the department is tolerably level; some heights, as those of Montmartre and Chaumont on the north side of Paris, rise to the height of 270 or 300 feet above the valley of the Seine. Mont Valerien in the west of the department, the highest hill in the neighbourhood, does not exceed 446 feet, which is about the height of Shooter's Hill, near London.

The department is entirely occupied by the tertiary formations enclosed within the chalk basin of Paris. These formations include limestone, gypsum, and marl. They yield excellent building-stone, of which there are immense quarries in the plain of Montrouge, and excellent plaster. A considerable extend of ground in the southern part of Paris, near the Luxembourg Palace, has been excavated in the process of quarrying for building-stone, and it is in part of these excavations that the celebrated catacombs have been formed. There are mineral waters at Auteuil and Passy; the latter, which are chalybeate, and valued for their astringent and tonic qualities, are the only ones which are frequented.

The department belongs altogether to the basin of the Seine. That river enters it on the south-east, and has a very winding course, partly in the department, partly on the border, from above Choisy to below Nanterre, of nearly 40 miles. The Marne enters the department on the east side, and has a winding course of 15 miles before it joins the Seine. Both these rivers are navigable throughout. The canal of the Ourcq enters the department on the north-east side, and runs about 6 miles to the basin of La Villette, just outside the wall of Paris on the north-east side. From this basin the canals of St. Denis and St. Martin communicate with the Seine; the first near the town of St. Denis, the second in the heart of Paris. The little canal of St. Maur, or of Marie Thérèse, shortens the navigation of the Marne above Charenton, by avoiding one of its longest reaches. The length of the inland navigation of the department is thus given in the official statements:—

	Miles.	Miles.
Rivers—Seine . .	36	
Marne . .	15	
	—	51
Canals—Ourcq . .	6	
St. Denis .	4	
St. Martin .	3	
St. Maur . .	1	
	—	14
		—
		65

The number of Routes Royales, or government roads, on Jan. 1, 1837, was fifteen, having an aggregate length of 77 miles, viz. 46 miles in repair, and 31 miles out of repair. These roads run from Paris in all directions: the principal are the great northern road through St. Denis to Boulogne and Calais, on the one hand, and to Rouen and Le Hâvre on the other; the north-eastern road by Le Bourget to Soissons, Laon, and so into Belgium; the eastern road by Bondy to Châlons, Metz, Nancy, and Strasbourg; the south-eastern road by Charenton to Auxerre, Lyon, and Marseille; the southern road through Villejuif to Nevers, Moulins, and Clermont; another southern road to Orléans, Châteauroux, and Limoges; the south-western road by Sèvres to Versailles, and thence on the one hand to Tours and Bordeaux, and on the other to Nantes, Rennes, and Brest; and the north-eastern road to Caen, Rouen, and Le Hâvre, by St. Germain-en-Laye. The aggregate length of the departmental roads was 153 miles; viz. 120 in good repair, 26 out of repair, and 7 unfinished. The bye-roads have a length of about 250 miles.

The department may be estimated to contain in round numbers 120,000 acres, of which about 73,000, considerably more than half, are under the plough, while only about 4000 acres are laid down in grass. In this preponderance of arable land, the environs of Paris present a remarkable contrast to those of London. The average production of grain in the department is thus given in Dupin's *Forces Productives, &c. de la France*, Paris, 1827:—

	Hectolitres.	Eng. Quarters.
Wheat . .	88,476	30,427
Rye and Maslin .	79,122	27,210
Barley . .	28,686	9,865
Potatoes . .	240,000	82,536
Oats . .	189,715	65,243

It is remarkable that the quantity of corn produced in the department, when its limited area is taken into account, is very far above the average of the departments in every species of grain which is cultivated in it; and in potatoes it exceeds the average of the departments, even without taking its limited area into the account. Buckwheat and maize are not grown. The productiveness of the department, which is by no means distinguished by natural fertility, is to be ascribed to the stimulus resulting from the proximity of the markets of the capital, and the facility which so large a city affords of getting manure. A great quantity of vegetables are grown, especially in the plain of St. Denis, north of Paris, which presents the appearance of a vast kitchen-garden.

About 9000 acres of ground are occupied in gardens or orchards, and about 7000 in vineyards. Montreuil, two or three miles east of Paris, is celebrated for its peaches; Grand Charonne, close to Paris on the east, for its grapes; and Fontenay, four miles south-west of Paris, for its strawberries and roses, which latter are grown for the apothecary and the perfumer, and give to the place its designation of Fontenay aux Roses. Nanterre, in the north-west of the department, is also celebrated for the growth of the same flower. Vitry-sur-Seine, on the left bank of the Seine, above Paris, is surrounded with nursery-grounds for rearing fruit-trees and ornamental trees.

The quantity of wine made is, for the area of the department, very considerable, but the quality is wretched: that of Surenne or Suresnes, west of Paris, once in high repute, has become, through inattention, proverbially bad. The woods occupy above 3000 acres. The principal are those of Vincennes, east of Paris, and of Boulogne, west of the same city. These are crossed by roads in various directions, and afford agreeable and much frequented walks to the Parisians.

The number of horses in the department was reported by M. Dupin (*Forces Productives*, &c.) in 1827 at 40,000, a number far above the average of the departments, and especially so when considered with relation to the area, but below the average when compared with the population. The number of horned cattle, as reported by the same authority, was above 12,000, more than three-fourths of which were cows, from whose milk the capital was partly supplied. A number of she-asses are also kept for their milk. The number of sheep is considerable. Among them are included English and Saxon breeds, which have been naturalized for the sake of their wool, and some Nubian rams. There are also some Thibet goats.

The department, exclusive of the city of Paris, is divided into two arrondissements; that of St. Denis on the north, and that of Sceaux on the south. Paris forms a third division [PARIS], so that the arrangement of the department is as follows:—

Arrondissements or other Divisions.	Situation.	Area in Square Miles.	Communes.	Cantons.	Population in 1831.	1836.
PARIS	Central	13	1		774,338	909,126
St. Denis	N.	78	37	4	87,282	110,057
Sceaux	S.	93	43	4	73,488	87,708
		184	81	8	935,108	1,106,891

In the arrondissement of St. Denis are the towns of St. Denis, population in 1831, 9686; in 1836, 9332 [DENIS, ST.]; Le Bourget; Neuilly, population 3168 town, 5602 whole commune; Boulogne; and Nanterre, population 2397 town, 2511 whole commune; to which may be added the villages of Clichy-la-Garenne, population 3035 village, 3109 whole commune; Aubervilliers, population 2187 village, 2230 whole commune; and Pantin, population 1830 village, 1881 whole commune. Some others, as Passy, Montmartre, La Chapelle, La Villette, and Belleville, are so close to Paris as to be properly suburbs of it. [PARIS, vol. xvii., p. 256.] Neuilly is on the Seine, about two miles north-west from Paris. There is a beautiful stone bridge here, finished A.D. 1772, over the Seine, about 800 feet long, with five arches, each of 128 feet span, and formed by segments of a circle of 160 feet radius. The houses are generally modern and well built. Among them are the villa of Saint Foix, built by the Count d'Argenson in 1755, and now belonging to the king of the French; that of Saint Jacques, once the residence of the Princess Borghèse; and the château of Bagatelle, built by Charles X. when a young man. A number of laundresses reside at Neuilly, and there are manufactures of earthern stoves and chemicals, distilleries, a refining-house for oil, and a steam flour-mill. There was some fighting here in 1815, on the approach of the English and Prussians to Paris. Boulogne has some neat country-houses. It gives name to the Wood of Boulogne, between the village and Paris. Sealing-wax is made here. Nanterre is near the Seine, two or three miles beyond Neuilly. It was burned by the English in 1346, and taken by them again in the war under Henry V. There are some traces of the antient fortifications of the place. In 1815 there was some fighting here between the French and the Prussians. There are two churches, one very antient, and several pleasant country-houses. There are manufactures of glue, purified neatsfoot-oil, 'animal black,' and chemical productions. There are tile-yards, plaster-quarries, and kilns, and a slaughter-house for pigs for the supply of the capital. A considerable quantity of pork, salt and fresh, is sold. Clichy-la-Garenne, on the Seine just below Neuilly, has several manufacturing establishments for ceruse, sal-ammoniac, glue, catgut, printing and other paper, card-board, small shot, lead pipe, and sheet lead. Aubervilliers, near the canal of St. Denis, was much injured in the skirmishing between the French and the allies in 1815. The front and steeple of the church were built in the reign of Henri II. There is a refining-house for sugar in the village, and there are numerous market-gardens round. Pantin, on the canal of the Ourcq, was the scene of a desperate struggle in 1814, when the allies marched upon Paris. The village stands in a plain, and comprises a number of well-built country-houses. There are manufactories for cotton and woollen yarn, in which steam-power is employed; gypsum is quarried, and there are lime kilns. The chief trade is in corn, flour, wine, brandy, vinegar, and plaster of Paris. The village of Autueil, on the bank of the Seine, in the commune of Neuilly, has been a favourite spot with literary men. Boileau, Molière, La Fontaine, Franklin, Helvetius, and Condorcet resided here.

In the arrondissement of Sceaux are—Sceaux, population in 1836, 1670; Antony, Bourg-la-Reine, Villejuif, and Gentilly, population 1596 town, 8616 whole commune; all south-west or south of Paris; Choisy-le Roi, population 3017 town, 3075 whole commune, on the Seine; Charenton, population 1925 town, 1991 whole commune, on the Marne [CHARENTON]; and Vincennes or La Pissotte, population 2551 town, or 2884 whole commune; and Montreuil, population 3239 town, 3338 whole commune, east of Paris. Vaugirard is virtually a suburb of Paris. [PARIS.] To these may be added the villages of Vitry, population 216 village, 2197 whole commune, near Villejuif; Arcueil, population 1679 village, 1816 whole commune, between Bourg-la-Reine and Gentilly; and Alfort. [ALFORT.] Sceaux had before the Revolution a noble mansion and park belonging to the duke of Maine, who assembled here the literati of Paris, among them Voltaire and Fontenelle, and after him to the duke of Penthièvre. During the Revolution it was sold and demolished by the purchaser; and the extensive park, of more than 800 acres, broken up for agricultural purposes. The garden of the menagerie, which was purchased by some private individuals and thrown open as a pleasure-ground to the public, still remains. The town is pleasantly situated, and has a number of good houses. The church was built by the great Colbert. The new burial-ground of the town contains the tombs of Florian and of Cailhava, a comic dramatist. Earthenware and glue are made, and there are two large weekly cattle-markets for the supply of Paris. There is one yearly fair. Antony is a neat town of about 1100 or 1200 inhabitants, on the slope of a hill rising from the bank of the Bièvre, which joins the Seine at Paris. There are a washing-place for wool, a bleaching-house for wax, and a manufactory of wax candles. Freestone is quarried near the town. There is a weekly market and a yearly fair. Bourg-la-Reine is also on the Bièvre: earthenware is manufactured here, and a considerable trade in cattle carried on: there are some handsome country-houses. Villejuif is on an eminence, and is one of the prettiest places round Paris. Oilcloth and soap are made, and building-stone, millstones, and excellent gypsum are quarried. Trade is carried on in corn, hay, wine, &c. Gentilly, distinguished as Le Grand Gentilly, is also on the Bièvre. There are manufactories of mineral acids, of linen handkerchiefs, and of soap; and bleach-grounds for linen. The village of Le Petit Gentilly, in the same commune as the preceding, is a suburb of Paris. The hospital of the Bicêtre [BICETRE] is in the commune of Gentilly. Choisy-le-Roi is in a pleasant situation: a wooden bridge has been built within the last few years over the Seine. The church was built by Louis XV., who had a favourite residence here. Soap, morocco-leather, oilcloth, chemicals, and earthenware are manufactured; and there are a distillery of acetous and pyroligneous acid, sugar-houses, and a glass-house for flint and common glass. Trade is carried on in wine, vinegar, wood, and coal. Vincennes is adjacent to the Wood of Vincennes. The castle of Vincennes is an antient fortress; the walls form a large and regular parallelogram surrounded with ditches and strengthened by eight square towers besides the donjon. The donjon, also square and very lofty, with towers at the angles, stands in the middle of the west side of the fortress. The castle of Vincennes has undergone great alterations, and its antient features have been intermingled with modern structures. La Sainte Chapelle is a fine Gothic building commenced by Charles V., and restored after the return of the Bourbons. It contains the monument of the Duke d'Enghien, who was shot at Vincennes, in the ditch of the castle, by order of Napoleon. This fortress is used as a military post, an artillery-school, depôt of artillery, and a state prison. The castle was saved from the allies in 1815, by the firmness of the governor, General Daumenil, who threatened, if reduced to extremity, to blow it up. The chief trade of Vincennes is in sheep and wool. Montreuil, distinguished from other places of the same name as Montreuil-sous-Bois, is about a mile north-north-east from Vincennes, on a fertile hill. There is a mansion with a fine park, and there are a number of country-houses. Leather, porcelain, and beehives are made, and peaches and pears of superior quality are grown. The gardens of the place are unrivalled in the department. Plaster is quarried in the neighbourhood. Vitry has numerous country-houses and nursery-grounds, and there are plaster-pits. The village is near the left bank of the Seine. Arcueil has the remains of a Roman aqueduct, built in the fourth century to conduct water to the palace of Lutetia, now Paris: it is from the arches of this monument that the place gets its name. It has some pleasant country-houses, a Gothic church, and an aqueduct, constructed in 1618, nearly in the line of the more antient one. Freestone is quarried; and there are nursery-grounds and a washing-place for wool.

The population, where not otherwise specified, is that of the commune, and from the census of 1831.

The department constitutes the diocese of the archbishop of Paris. It is in the jurisdiction of the Cour Royale of Paris and of the Académie Universitaire of that city; and in the first military division, of which the head-quarters are at Paris. It returns fourteen members to the Chamber of Deputies. In respect of education it is one of the most advanced of the French departments; of every hundred young men enrolled in the military census for 1828-29, seventy-one could read and write; the average of France being just above thirty-nine. The historical events connected with the department are chiefly noticed elsewhere. [ST. DENIS; PARIS.] It was included in the territories of the Parisii, a Celtic people, and in the Roman province of Lugdunensis Quarta, or Senonia: in the middle ages it formed part of the province and military government of Ile de France.

SEINE INFE'RIEURE, a department of France, bounded on the north and north-west by the British Channel; on the south-west by the department of Calvados, from which it is separated by the mouth of the Seine; on the south by the department of Eure, from which also it is in some places separated by the Seine; on the south-east by the department of Oise; and on the north-east by that of Somme. Its form approximates to a triangle, of which the base is formed by a line facing the east, extending from Le Tréport, in the neighbourhood of Eu, to the neighbourhood of Gournay; and the vertex by Cape La Hève near Le Hâvre. The length of a line drawn between the extremities of the base is about 48 miles; the length of one drawn from Le Tréport to Cape La Hève, about 70 miles; and from the neighbourhood of Gournay to Cape La Hève, about 73 miles. The area of the department is estimated at 2334 square miles, being a trifle under the average area (2380 square miles) of the French departments, and rather less than the united areas (2377 square miles) of the English counties of Hants and Berks. The population, in 1831, was 693,683; in 1836, 720,525, showing an increase in five years of 26,842, or nearly 4 per cent., and giving 303 inhabitants to a square mile. In amount and density of population it exceeds the average of the French departments (390,010 inhabitants, or 164 to a square mile) in the proportion of 11 to 6, or nearly 2 to 1: it far exceeds in amount of population the two counties with which in area we have compared it, taken together; and exceeds all the English counties, taken singly, except Lancashire, Yorkshire, and Middlesex; and all the French departments, except those of Seine and Nord. Rouen, the capital, is 65 miles in a direct line north-west of Paris, or 76 miles by the road through Pontoise, Magny, St. Clair, and Ecouis.

The department is almost entirely included in the district occupied by the cretaceous formations which form the chalk basin of Paris. The coast has a rounded outline, presenting no remarkable headland except Cape La Hève; it is lined nearly throughout by chalk cliffs, broken at intervals by the openings through which the rivers fall into the sea: the only harbours along the coast are formed by these openings. The cliffs vary in height from 150 to 700 feet, which elevation they attain near Fécamp. (Dawson Turner, *Tour in Normandy*.) None of the hills are very lofty: the principal are a remote branch from the Ardennes, which cross the department from the east side to Cape la Hève, which forms their termination, and separate the waters which flow into the Seine from those which flow into the English Channel; they consist of chalk. Marl abounds in several places, and sand, which is used in the manufacture of glass. Brick-clay, pipe-clay, and clay suited for sugar-refiners, for making crucibles, and for earthenware, and even for fine porcelain, are procured; limestone and sandstone are also obtained, and there is marble of various kinds, but in small quantity. A small quantity of peat is obtained, and iron-stone is said to have been formerly procured near Forges-les-Eaux, on the east side of the department, between Neufchâtel and Gournay. There are mineral waters at Forges-les-Eaux, Aumâle, Gournay, and Rouen.

The department, south of the range of hills mentioned above, belongs to the basin of the Seine, which first touches the department on the south side, and has the remainder of its course, which may be estimated at 100 miles (the official statement is 97 miles), navigable throughout, upon or within the boundary of the department. It winds very much in this part of its course, as may be estimated from the statement that the distance from its first touching the department to its mouth is only about 48 or 49 miles in a straight line. The principal feeders of the Seine are the Epte and the Andelle, of which two only the sources and the upper part of their course belong to this department, the Cailly, the Austreberte or Sainte-Austreberte, the Bolbec, and the Lézarde, all very small. We have enumerated them in the order in which they join the Seine; they all fall into it on the right bank. Of the streams which flow into the Channel, the principal are the Bresle, or Briêle, which bounds the department on the east side, the Yéres, the Arques, which receives the Béthune and the Eaulne, the Seye or Scie, the Saanne or Saane, and the Durdan or Durdent. We have enumerated these in their order from east to west. The length of the Bresle, which is the most considerable of them, may be estimated at 35 miles. The Seine is the only navigable river in the department, and there are no navigable canals. A railroad from Paris to Le Hâvre is in course of construction, and will form, with the London and Southampton (or South-Western) Railway, a ready communication between Paris and London.

The number of Routes Royales, or government roads, on 1st Jan., 1837, was twelve, having an aggregate length of 355 miles, viz. 181 in repair, 171 out of repair, and 3 unfinished. The principal road is that from Paris by Rouen to Le Hâvre. It enters the department on the south-east side, and runs to Rouen, and from thence by Yvetot, Valliquerville, Bolbec, and Harfleur to Le Hâvre. The road from Paris to Rouen, by St. Germain, Poissy, Mantes, Vernon, and Pont de l'Arche, enters the department more towards the west than the former road, which it joins just before entering Rouen. The road from Paris to Dieppe enters the department on the south-east, near Gournay, and runs north-westward through Forges les-Eaux, les Grandes Ventes, and Grand Torcy. Roads from Rouen run one northward to Dieppe; one north-eastward to Neufchâtel, beyond which it divides into two branches, one by Blangy to Abbeville, department of Somme, the other by Aumale and Poix to Ameins, department of Somme; another eastward to Gournay, and thence to Beauvais, department of Oise; and another southward across the Seine to La Bouille, where it divides, one branch leading to Pont Andemer, the other to Bernay, both in the department of Eure. A branch from the road between Rouen and Le Hâvre leads to Fécamp; and another from Le Hâvre leads along the coast by Harfleur, Fécamp, St. Vallery-en-Caux, Veulles, Dieppe, and Criel to Eu, whence it turns inland to Abbeville. The departmental roads had, at the same time, an aggregate length of 238 miles, viz. 136 in repair, 7 out of repair, and 95 unfinished. The by-roads had an aggregate length of about 17,000 miles.

The climate is cold and moist, especially along the coast and on the eastern side of the department. The soil is varied, but generally fertile. The area of the department may be estimated in round numbers at 1,500,000 acres, of which about 950,000 acres, or nearly two-thirds, are under the plough. Agriculture, though on the whole flourishing, has by no means attained the degree of perfection of which it is susceptible. The mode of cultivation in the peninsula of Caux, formed by the Seine and the English Channel, which now constitutes the arrondissement of Le Hâvre, is much like that of French Flanders. The farmer is distinguished by his neatness, by the comfortable furniture of his house, the plantations of oaks, elms, beeches, and pines round his homestead, and the neatness and productiveness of his garden, enclosed by a live hedge. The rotation of crops is usually triennial, and the fallow of the third year has been generally superseded by a crop of trefoil, flax, peas, vetches, rape, &c. The manures employed are dung, marl, gypsum, brought from the neighbourhood of Paris; the last is employed for the artificial grasses and for orchards. Threshing-machines have been partially introduced; but, generally speaking, the implements of agriculture have undergone little improvement during the last forty years.

The produce of the department in corn is very considerable. In wheat it exceeds the average produce of the departments of France in the proportion of five to two; in barley, rye, maslin (wheat and rye mixed), and in potatoes, the produce falls short of the average. Scarcely any buckwheat and not any maize is grown. Peas, beans, vetches, lentils, turnips, rape, cole, and flax are cultivated. In oats the produce is not one-fourth of the average; a considerable quantity of this grain is brought in from the adjacent department of Calvados. The principal corn districts are in the centre of the department. The eastern side has a greater proportion of pasture; the cultivation of the oleaginous seeds, rape, cole, &c., characterises the coast, and the banks of the Seine are altogether less productive than the other parts, although possessed of much picturesque beauty.

The meadows and grass-lands occupy about 70,000 acres, and the heaths and open pastures about 45,000 acres. The grass-lands are chiefly in the valleys and along the banks of the rivers. The number of horses is very great, exceeding the average of the departments in the proportion of eight to three; they are the only animals employed in agriculture. They are good for draught and other labour; but the race of the horses of Caux, once much valued as carriage horses and for mounting dragoons and heavy cavalry, is extinct. In the number of cows this department also far exceeds most others, but the number of oxen is comparatively small. The cows reared in the department, especially those of Caux, are inferior to those of the departments of Calvados and of La Manche; many are brought from these departments to the rich pastures along the eastern side of this department. The number of sheep is considerable. Since the commencement of the present century a great change in the breed has taken place. The native sheep have to a considerable extent been replaced by mixed breeds, some of them English, which give a tolerably fine wool. The merinos, which had been naturalised, have been so much neglected as to have almost become extinct; and Dupin, writing in 1827, complains that the low price of wool, and the unequal manner in which the local duties on the article were levied, had led the farmer to neglect the fleece for the sake of the carcass. Goats are not common, but those of Tibet have been tried with success. Swine and poultry are common; the pullets of the district of Caux and the ducks of Rouen are in high repute.

There are no vineyards in the department, but the quantity of orchard and garden ground is 150,000 acres. The apple and pear are the fruits chiefly cultivated; the cider and perry made from these constitute the principal drink of the common people. The walnut is grown in the eastern parts of the department.

The woodlands occupy about 170,000 acres. There are few extensive woods, but innumerable small plantations round the farm-houses and in the hedge-rows, which serve to supply the wants of the farmer. Turf is the fuel employed by many, and it is also used by some manufacturers; but these chiefly employ pit-coal, of which a large quantity is imported. The oak, the beech, and the hornbeam are the trees chiefly grown; but the ash, the elm, the birch, the fir, the aspen, the maple, the chesnut, the wild cherry, and the lime-tree are also common.

The department is divided into five arrondissements, as follows:—

Name.	Situation.	Area. Sq.M.	Cantons.	Communes.	Population. 1831.	Population. 1836.
Rouen	S.	502	15	155	225,996	238,805
Dieppe	N.	448	8	168	109,978	112,427
Le Hâvre	W	341	9	121	134,755	142,292
Yvetot	N.W	447	10	169	138,429	142.680
Neufchâtel	E. & S.E.	596	8	144	84,525	84,321
		2334	50	757	693,683	720,525

In the arrondissement of Rouen are—Rouen, population in 1831, 88,086; in 1836, 92,083 [ROUEN]; Darnetal, population 5572 [DARNETAL]; and Duclair, on or near the right bank of the Seine; Elbœuf, population 9951 town, or 10,258 whole commune [ELBŒUF]; and La Bouillé, on the left bank of the same river; Ry, near the Andelle; Cailly, Fontaine, and Montville, on the Cailly; Clères, on a small stream flowing into the Cailly; Pavilly, on the Sainte Austreberte; and Buchy, in the part of the arrondissement remote from the Seine, near the centre of the department. Duclair or Ducler is a small place, consisting of a single row of houses, immediately under a chalk cliff which here overlooks the Seine, and in which there are some excavated habitations for the poorer classes. The river, which here winds very much, is of great breadth; the opposite land is a low marshy flat. The parish church is of Norman architecture; a considerable quantity of painted glass yet remains in the windows. There are lime kilns. Three fairs are held in the year for cattle, horses, leather, hardwares, and furniture. La Bouillé is at the foot of a steep hill, and is a great thoroughfare: passage-boats run three times a day to and from Rouen. There are some excavations in a neighbouring quarry remarkable for their stalactites and for the great extent of their passages. Ry has manufactures of saltpetre, and a considerable trade in corn and cattle. At Montville cotton is spun and woven. Clères has paper and cotton mills, moved by the little stream (called the Bapaume) which falls into the Cailly: there is one yearly fair. Pavilly has manufactures of soft soap, linen, paper, and cotton-yarn; and the townsmen carry on trade in grain, linen, flax, and cattle and poultry. There are four yearly fairs. The population may probably be estimated at 2000. Saltpetre is made at Buchy, and trade is carried on in wool, iron, and cattle: there are two yearly fairs. There are several large villages: as Deville, population 3185; Marommes, population 2411; and Malaunay, all on the Cailly; St. Martin du Vivier, and others near Rouen, the inhabitants of which are engaged in the cotton manufacture, of which Rouen is the centre.

In the arrondissement of Dieppe are—Dieppe, population in 1831, 16.016; in 1836, 16.820 [DIEPPE], at the mouth of the Arques; Arques [ARQUES], Grand Torcy, and Bellencombre, on the same river; Les Grandes Ventes, between the Arques and the Bethune; Envermeu, on the Eaulne; Criel, on the Yères; Eu, population 3356 town, 3543 whole commune [EU]; and Le Tréport, population 2061 town, 2267 whole commune, on the Bresle; St. Victor, Auffay, and Longueville, on or near the Seye or Scie; Anglesqueville or Englesqueville, on the Saane or Saanne, and Bacqueville or Basqueville, population 1550 town, 2665 whole commune, on a stream flowing into it; and Toste and Boscleliard or Bosclar, in the central part of the department. Le Tréport was once of greater importance, but it suffered much both in the wars with the English and in the religious contests of the sixteenth century. It is now a small fishing town, the inhabitants of which are engaged in the herring and mackerel fisheries. A few small vessels, chiefly from England and Sweden, enter the port (which, from the accumulation of sand, is not accessible to large ships), and import and take away merchandise to the value of about 70,000 fr., or nearly 3000*l*. per annum. Some vessels were formerly fitted out for the cod fishery, but this has been given up. Soap and locks are manufactured, and linseed oil expressed. The inhabitants of Auffay trade in corn and hides. Longueville has the ruins of a priory, founded and partly built A.D. 1084, and antiently of great opulence. Toste or Tôtes has a prison. There are many country-seats round the town. The inhabitants have three fairs in the year: a great number of sheep are sold. At the village of St. Nicholas d'Aliermont (population 1805), near Dieppe, is an extensive manufactory of clock-movements, which gives employment to 300 work-people.

In the arrondissement of Le Hâvre are—Le Hâvre, or more fully Le Hâvre de Grace, population in 1836, 25,618; with its suburb Ingouville, population in 1831, 2507 town, 5666 whole commune [HAVRE, LE]; and Harfleur, on the right bank of the Seine, close to its mouth; Montivilliers, population 1988 town, 3828 whole commune, on the Lézarde, which joins the Seine at Harfleur; St. Romain, between the Lézarde and the Bolbec; Bolbec, population 7063 town, 9630 whole commune [BOLBEC]; and Lillebonne, on the Bolbec; Fécamp, population 8867 town, 9123 whole commune, near the sea [FECAMP]; and Château-et-Marché, Criquetot-l'Esneval, Goderville, Breauté, and Benarville, in the more inland part of the arrondissement. Harfleur, antiently written Hareflot, Hareflou, and Harfleux, was in the middle ages an important harbour and place of strength; the Portuguese and Spaniards obtained, about the close of the thirteenth and the commencement of the fourteenth centuries, a complete exemption from duties; and a similar privilege was soon after granted to the Lombards. The Spaniards brought wool for the clothiers of the neighbouring town of Montivilliers. In its prosperity Harfleur was attacked, and, after a vigorous defence, taken by the English under Henry V. (A.D. 1415), who expelled the inhabitants and re-peopled the town with English. It was gallantly retaken (A.D. 1433) by the surrounding peasantry; taken again by the English (A.D. 1440), and finally wrested from them about ten years afterwards by Charles VII. of France. Notwithstanding these disasters, it recovered its prosperity; but the revocation of the Edict of Nantes finally ruined it. There are many remains of the antient walls and gates. The former harbour is now dry, but small boats come up the Lézarde to the town when the tide is in. There is a beautiful Gothic church, the elegant tower of which is crowned by pinnacles at the angles, and by an octagonal spire connected with the pinnacles by flying buttresses. There is also an hospital. The townsmen manufacture earthenware and refine sugar; and they are actively engaged in fishing. There are four yearly fairs for cattle. Montivilliers had in the middle ages a wealthy nunnery, of which the church remains. The tower is of Norman architecture of the eleventh century; the rest of the building is of various dates, but handsome as a whole. The town is neat and beautifully situated in the valley of the Lézarde: there are, besides the above-mentioned church, a Protestant church, a high school, an hospital, and a small theatre. The townsmen, who were eminent in the fourteenth century for the manufacture of woollen cloth, carry on the same manufacture now, and they also make lace, cotton-yarn, leather, and paper; there are bleach-grounds for linen and a refining-house for sugar; trade is carried on in groceries and hardwares. There are two yearly fairs. Lillebonne was the Juliobona of the Romans, the chief town of the Caleti. Several Roman roads met here. A great number of Roman antiquities have been found at Lillebonne, and new researches are continually increasing the number; among the most important are the remains of a theatre, an aqueduct, and several tombs, besides medals, statues, and other antiquities. The dukes of Normandie had a castle here, the ruins of which are worthy of notice from their extent. An old circular tower, probably the keep, is said to have been built by William the Conqueror, and to have been the place where he assembled his barons to determine on the invasion of England: the wall of this tower is full ten feet thick. The town, though presenting in some points of view a picturesque appearance, is really a wretched place. The townsmen manufacture cotton-yarn, calico, and leather, and trade in cloth, groceries, hardwares, and cattle: there are two yearly fairs. The population of the commune may be estimated at from 1800 to 2000. Criquetot-l'Esneval and Goderville participate in the cotton manufacture, which gave employment, in 1827 (Dupin, *Forces Productives*, &c.), to between 600 and 700 persons in and around these two places.

In the arrondissement of Yvetot are—Yvetot, population in 1831, 7737 town, 9021 whole commune; in 1836, 9213 [YVETOT]; Valliquerville, Fauville-en-Caux, Valmont, Ourville, Doudeville, population 3172; Bourctout, Fontaine-le-Dun, St. Laurent-en-Caux, Lindeboeuf, Ouville, Yerville, and Les Baons, in the central part of the arrondissement; St. Valery, or St. Vallery-en Caux, population 5104 town, 5328 whole commune; and Veulles, or Veules, population 1530, on the sea; Grainville, Cany, and Vittefleur, on the Durdan; and Caudebec, population 2782 town, 2832 whole commune, on the right bank of the Seine; and Mailleray, or La Mailleraye, on the left bank. Valliquerville, or Valliquierville, has a church with a very lofty tower: the inhabitants are engaged in the cotton manufacture. Valmont has some share in the manufacture of cotton-yarn and goods; linen is manufactured at Ourville and at Ouville; at Doudeville are several yearly fairs for cattle and mercery; and at Fontaine-le-Dun four fairs for cattle, linens, muslins, and other cotton goods. St. Valery-en-Caux is pleasantly situated, and has a small but safe harbour, much improved by some works carried on of late years. The mackerel, herring, and other fishery is carried on with great activity; of the herrings, some are cured; others, with the rest of the fish, are sent to Paris. The Newfoundland cod fishery employs some of the vessels belonging to the port. There is a good deal of business done in linens and cotton goods; and Baltic and Norway timber for shipping is imported. Soda is manufactured. At Grainville, distinguished by the epithet La Teinturière, there is an hospital. There are three fairs for horses and cattle. Caudebec was antiently the capital of the district of Caux, and was frequently taken and retaken in the English wars of the fifteenth and the religious wars of the sixteenth centuries. The prosperity of the place was much affected by the revocation of the Edict of Nantes. It is in a very picturesque situation, on the side of a steep hill rising from the Seine, which is here nearly a mile broad. Some of the houses are built on terraces on the side of the hill, and have hanging gardens. The church is a beautiful Gothic structure, with a lofty spire, and a richly sculptured portal: and there are an hospital and public gardens. The town is surrounded by a wall flanked with towers and strengthened with ditches. The manufactures of the place are cotton-yarn, printed calicoes, and other cotton goods, hats, leather, starch, refined sugar, vinegar, and soap; there are bleach-grounds and dye-houses. There are good quays along the banks of the Seine, and the vessels which run between Rouen and Le Hâvre procure biscuit and other provisions at Caudebec. The place is the mart of the surrounding country, and considerable trade is carried on in corn, for which there is a good weekly market, cattle, poultry, feathers, brandy, cider, slate, iron, coal, deals, &c. There are three yearly fairs.

In the arrondissement of Neufchâtel are—Neufchâtel, population in 1831, 2998 town, 3430 whole commune; in 1836, 3463; Bures and Gaillefontaine, on the Bethune; St. Saëns, population 1624 town, 2330 whole commune, on the Arques; Loudinières, on the Eaulne; Faucarmont and Grancourt or Grandcourt, on the Yères; Blangy and Aumâle, population 1798 town, 1980 whole commune, on the Brêle; Forges-les-Eaux, and Gournay, population 2591 town, 3030 whole commune, on or near the Epte; and Argueil, near the Andelle. Neufchâtel, distinguished as Neufchâtel-en-Bray, is on the slope of a hill near the right bank of the Bethune, in a hilly and woodland country affording good pasturage. The town is not well built; it has an hospital and a prison. It was formerly capital of the district of Bray, and was repeatedly taken by the English or by the contending parties in the civil strifes of France. There was a castle built by Henry I. of England. Neufchâtel has one or two subordinate courts of justice, a public library, and an agricultural society. The townsmen manufacture woollen hose (but this branch of industry has much declined), hats, and cotton goods: there are brew-houses, glass-houses, dye-houses, and tan-yards. Trade is carried on in flour, butter, and in the little cream-cheeses of the district, called Neufchâtel cheeses. There are limestone quarries near Gaillefontaine; and trade is carried on in salt butter, cattle, and mercery: there are numerous fairs. St. Saëns has manufactures of linen, glass, leather of various kinds, and glue; there are twelve yearly fairs; trade is carried on in corn, wood, cattle, and hides. At Blangy a great deal of cider is made, and many horses are sold. Aumâle is built on the slope of a hill; it was, during the war of the League, the scene of a battle between the Royalist cavalry under Henri IV. and the united forces of the Spaniards and Leaguers under the dukes of Parma and Mayenne, in which Henri was wounded. Woollen cloth, serge, and earthenware are made in the town. There are mineral springs. Forges-les-Eaux is on a hill which rises above a pleasant valley. The place is well known for its mineral waters, which are aperient, tonic, and diuretic; there are gardens, pleasure-grounds, and other attractions for those who resort to take the waters. Some manufactures of linen, sulphate of iron, and especially earthenware and coarse pottery, are carried on. Considerable business is done in corn; there are two fairs in the year, and a great market or fair monthly. Peat is dug near the town. Gournay is thought to have originated prior to the settlement of the Normans; it was on a causeway across the morass which here separated the Bellovaci from the Caleti. During the existence of the duchy of Normandie, it was of importance as a frontier town towards the domains of the French king. It is a small clean town, on the banks of the Epte, surrounded with a pleasant boulevard. The houses, which are of wood and clay, are of mean appearance. The church was built at various periods, between the end of the eleventh and the thirteenth centuries, and the architecture varies with the date of erection; the interior is of Norman architecture, but in the west front the pointed arch is used. There is a handsome fountain in the town, also an hospital or almshouse. Linen, porcelain, leather, and candles are made in the town, and glass in the neighbourhood. Considerable trade is carried on in butter (which is in high repute, and of which a great quantity is sent to Paris), cattle, and mercers' goods; there are a considerable weekly market for pigs and three yearly fairs for provisions and general goods. There are some mineral waters near the town. Gournay has a public library of 1000 volumes.

The population, where not otherwise described, is that of the whole commune, and from the census of 1831.

The department constitutes the diocese of Rouen: and is under the jurisdiction of the Cour Royale and of the Académie Universitaire of that city. It is included in the fourteenth military division, of which the head-quarters are at Rouen. It sends eleven members to the Chamber of Deputies.

In respect of education it is somewhat above the average of France; of the young men enrolled in the military census of 1828-29, 43 in every hundred could read and write; the average of France being a little above 39.

The department occupies an important place among the manufacturing departments of France. The cotton manufacture, of which Rouen is the centre, is the staple. A large quantity of cotton-yarn is spun, but it is not of the finest quality; and, generally, the manufactures of the department are calculated for the middling and poorer classes. Rouen produces checked and striped calicoes, classed with similar articles under the general title of 'Rouenneries;' at Bolbec are made calicoes and linen and cotton handkerchiefs. The weavers are dispersed through the department, and the material is given out to them by the manufacturers, through the intervention of an intermediate class, called 'factors.' Such at least was the system when Dupin published his *Forces Productives*, &c., 1827. Nankeen is manufactured at Darnétal, and a variety of mixed fabrics, linen and cotton, at Rouen. Dyeing is actively carried on in and round Rouen. Woollen cloth is manufactured at Darnétal, and especially at Elbœuf; wool is dyed at Rouen and Elbœuf. Serge is manufactured at Aumâle. The woollens of the department are sent into the interior of France, to Paris, Limoges, Lyon, and Bordeaux; and are exported to Italy, Germany, and the Levant.

In the earliest historical period, the department was comprehended in the territories of two nations, the Caleti, or Caletes, and Veliocasses, or Velocasses, both enumerated by Cæsar among the Belgic nations confederated against him (Cæs., *De Bell. Gall.*, lib. ii., c. 4); but they were afterwards transferred by Augustus to the province of Celtica, or Lugdunensis, upon the subdivision of which they were comprehended in Lugdunensis Secunda. The names of these nations are variously written. Cæsar speaks of the Caleti, or in some copies Caletes; Pliny, of the Galleti; Strabo, of the Καλῖτοι, and in one place, probably by a transcriber's error, of the Ναδῖτοι; Ptolemy calls them Καλῖται. Cæsar speaks of the Velocasses, or Vellocasses, and in one place (*De Bell. Gall.*, lib. vii., c. 75), of the Bellocassi; Pliny, of the Vellocasses; and Ptolemy, of the Οὐενελιοκάσιοι. The chief town of the Caleti was Juliobona (Ἰουλιόβονα, Ptol.), now Lillebonne; to which we may add the Carocotinum and Lotum of the Antonine Itinerary, the former at or near Harfleur, the latter at or near Caudebec; and the Gravinum of the Peutinger Table, which may perhaps be Grainville in the arrondissement of Yvetot. The chief town of the Veliocasses was Rotomagus, the Ῥωτόμαγος, or according to some MSS. Ῥατόμαγος, of Ptolemy; the Rattumagus of the Peutinger Table; and the Rothomagus of the Notitia Imperii. Ammianus Marcellinus writes the name in the plural Rotomagi. It is the modern Rouen. Sanson had fixed the Uggade of the Antonine Itinerary at Elbœuf; but D'Anville, with better reason, fixes it at Pont de l'Arche, in the adjacent department of Eure.

In the middle ages this department was the nucleus of the duchy of Normandie. [NORMANDIE.] It included the whole or part of the districts of Bray, Caux, and Roumois. It is rich in the antiquities of the middle ages, in ecclesiastical and castellated buildings, or in their remains. The cathedral and several of the churches at Rouen, the churches of St. Jacques at Dieppe, of Arques, of La Trinité and St. Etienne at Fécamp, of Montivilliers and of Harfleur, of Ducler, Moulineaux (now in ruins), Pavilly, and Yainville, all near Rouen, and of Gournay, are interesting specimens of architecture of various styles from the massive Norman to the richness of the decorated English, if we may apply this latter name to foreign structures.

Among the most interesting ruins are those of the abbey of Jumièges, in a small peninsula formed by the winding of the Seine just below Rouen. It was a Benedictine abbey, originally founded in the middle of the seventh century; very shortly after the foundation, the establishment comprehended nine hundred monks, and fifteen hundred attendants and dependants. The abbey was destroyed by the Northmen in their inroads; but was restored by Guillaume (William), duke of Normandie, surnamed Longue-Epée, son and successor of Rollo; and continued to prosper down to a late period, though not without the intervention of some disasters, especially during the English wars of Henry V. and Henry VI., and the Huguenot wars of the sixteenth century. The present building was erected at various epochs. The western front of the abbey church is yet standing: it is of a simple character, and consists of two towers surmounted by spires, and a gable between them. The towers are square at the base, and octagonal in the upper part. The arches of the doors and windows are partly round, partly pointed. Of the central tower only a fragment remains. The nave is tolerably entire; but the choir and Lady-chapel, as well as the cloisters, are nearly demolished; and the work of demolition is still going on by the occasional removal of the stones for building. There are the remains of a second church, that of St. Pierre, also belonging to the abbey. The abbey-church of St. George Bocherville near Rouen is tolerably entire, 'and it is certainly at once the most genuine and the most magnificent specimen of the circular style now existing in Upper Normandy.' (Dawson Turner's *Letters from Normandy*.) The west front is flanked with towers: its general characteristic is simplicity, but there is a richly ornamented doorway. The church is adorned with a variety of sculpture, some of which is of the most grotesque character. The monastic buildings are occupied as a manufactory. The chapter-house which stands between them and the church is in a very dilapidated condition; but it is worthy of examination from the curious sculpture with which it is decorated.

There are the remains of antient castles at Rouen and Dieppe, and especially at Arques near Dieppe.

SEINE ET MARNE, a department of France, bounded on the north by the department of the Oise, on the north-east by that of Aisne, on the east by those of Marne and Aube, on the south-east by that of Yonne, on the south by that of Loiret, and on the west by that of Seine et Oise. Its form is irregular: the greatest length is from north-north-east, near the river Ourcq, to south-south-west, near Beaumont-en-Gâtinais, 74 miles; its greatest breadth is from the neighbourhood of Brie-Comte-Robert to the neighbourhood of Villenoxe in the department of Aube, 45 or [illegible] miles. The area is estimated at 2181 square miles, being rather below the average of the French departments, and about equal to the conjoint areas of the English counties of Gloucester and Warwick. The population in 1831 was 323,[illegible]; in 1836 it was 325,881, showing an increase in five years of 1988, or about 0·6 per cent., and giving 149 inhabitants to a square mile. Both in amount and density of population it is below the average of the French departments; and below either of the English counties with which we have compared it. Melun, the capital, is 24 miles in a direct line south-east of the barriers of Paris, or 28 miles by the road through Charenton, Villeneuve St. Georges, and Lieursaint.

There are no mountains in the department, nor any hills of considerable elevation; the highest are in the southern part. The surface is generally undulating. The south-east part is occupied by the formations of the cretaceous group; the rest by the tertiary formations of the Paris basin. The mineral treasures of the department are unimportant: it yields neither coal nor iron, nor are there any iron-works. Good building-stone is quarried, especially near Château-Landon, in the valley of the Loing, near the southern border of the department, and sandstone fitted for pavement in the neighbourhood of Fontainebleau, on the Seine, and at Coulommiers, on the Grand Morin. The best millstones in Europe are dug at La Ferté-sous-Jouarre, on the Marne, and good alabaster is quarried. Peat is dug at Claye between Meaux and Paris, and at Crouy-sur-Ourcq, on the northern border of the department; and sand, which is valuable for making flint-glass, is procured near Fontainebleau. There are mineral waters at Provins.

The department is included in the basin of the Seine, which river crosses it from east to west, forming a crescent convex towards the south, and passing by Bray, Montereau, and Melun: it is navigable throughout. The Marne also crosses the department from east to west, not far from the northern boundary; its channel is very winding, and navigable throughout; it passes La Ferté-sous-Jouarre, Meaux, and Lagny; its junction with the Seine is not in this department. The Yonne has a small part of its course in this department, just above its junction with the Seine, which takes place on the left bank of the latter river, at Montereau: it is navigable in all that part which belongs to the department. The Loing crosses the southern boundary near Château Landon, and flows northward past Nemours and Moret, into the Seine, which it joins on the left bank; above 20 miles of its course belong to this department, but it is not navigable, except in those places where it forms part of the line of the Loing canal. The Suzein, the Bez, and the Lunain, feeders of the Loing, have part of their course in this department. The Yéres rises in the department, and flows westward past Resoy and Chalines into the adjacent department of Seine et Oise, where it joins the Seine: it receives the Yvron. The Essonne, another feeder of the Seine, just touches the south-west border. The Marne receives the Petit Morin and the Grand Morin on left bank, and the Ourcq on the right bank; only a part of the course of these rivers belongs to this department. The Ourcq and the Grand Morin are navigable; the former throughout that part of its course which belongs to this department, and the latter from above Crécy. The Grand Morin receives the Aubetin. In the central part of the department are a number of pools, none of them of great size, but abounding in fish.

There are two canals in the departments, that of Loing, which follows the valley of the Loing (sometimes being carried along the bed of the river), and unites the Loire with the Seine; and that of Ourcq, which follows the valleys, first of the Ourcq and then of the Marne, to the village of Annet, between Meaux and Lagny, and then leaves the valley of the Marne to take another direction to Paris. It opens a communication between the Ourcq and Paris, and is especially designed to supply the capital with water. The official statement of the inland navigation of the department is as follows:—

		Miles.	
Rivers.—	Seine . .	67	
	Yonne . .	10	
	Marne . .	62	
	Ourcq . .	13	
	Grand Morin .	9	
		—	161
Canals.—	Loing . .	22	
	Ourcq . .	41	
		—	63
			224

What is called the Coruillon canal is a short cut, less than half a mile long, intended to avoid a bend in the Marne near Meaux.

There were in the department, on January 1, 1837, ten Routes Royales, or government roads, having an aggregate length of 320 miles, viz. 242 miles in good repair, and 78 out of repair. The principal roads are those from Paris to Lyon by Nevers and by Auxerre; that to Bâle by Troyes, Chaumont, and Vesoul; those to Strasbourg by Châlons-sur-Marne and Nancy, by Coulommiers, and by Montmirail; and that to Mons by Soissons and Laon. The road to Lyon by Nevers enters the department on the west side, and runs south-east by Fontainebleau and Nemours into the department of Loiret; the road by Auxerre enters the department also on the west side, not far from the other, and runs by Melun and Montereau into the department of Yonne. The Bâle road enters the department near Brie-Comte-Robert, and runs by Nangis and Provins into the department of Aube. The Strasbourg road, through Châlons-sur-Marne, crosses the northern part of the department through Meaux and La Ferté-sous-Jouarre; that through Coulommiers runs just to the southward of the Châlons road, through Lagny, Crécy, Coulommiers, and La Ferté-Gaucher; and the road through Montmirail branches off from the Châlons road at La Ferté-sous-Jouarre: the Mons road just crosses the north-west corner of the department through Dammartin. Roads lead from Melun on one side to Fontainebleau, and thence to Orléans in the department of Loiret; and on the other side to Chaulmes, Meaux, and into the Mons road at Villers-Coterets; and a road from Fontainebleau runs by Moret into the Auxerre and Lyon road just beyond Montereau.

The departmental roads had at the same period an aggregate length of 352 miles, viz. 297 miles in good repair, 46 out of repair, and 9 miles unfinished. The bye-roads had an aggregate length of about 10,000 miles. The department is provided with the means of communication, both by land and water, far better than most of the departments.

The surface of the department may be estimated at 1,400,000 acres, of which nearly 920,000, or about two-thirds, are under the plough. The quantity of wheat grown is more than twice the average quantity produced in the other departments. The produce in barley also is double the average of the whole kingdom. In rye and maslin (wheat and rye mixed) the quantity falls below the average of the departments, and the deficiency in oats is still greater. In potatoes, too, the crop is comparatively small, and buckwheat and maize are not grown at all. So great however is the preponderance of the wheat crop, that the department is enabled to export from one-fourth to one-third of its harvests; the greater part of what is exported is sent to Paris. Hemp and flax are also cultivated.

The quantity of meadow and grass land is above 80,000 acres; and there are about 23,000 acres of heath or common, or other uninclosed pasturage. A great number of horses are kept, and hardly anything but horses are employed in agriculture. The number of horned cattle is considerable; but it is a dairy rather than a grazing country. In the number of cows it far exceeds the average of the departments; in the number of oxen it falls very far below them. The cheese known as the Brie cheese is in high repute; more than 3,200,000 kilogrammes, or 64,000 cwts., are sold in the market of Meaux in the course of the year. The number of sheep is very great, especially of merinos and cross-breeds. The number of native sheep, though tolerably great, does not exceed the average of the other departments. The quantity of wool produced exceeds the average produce of the departments in the proportion of nearly three to one; it is employed by the manufacturers in the departments of Eure, Oise, Aisne, and Marne. Many of the English long-woolled breeds of sheep have been introduced.

The vineyards occupy 45,000 acres, which is below the average extent of the vineyards in the departments, but the quantity of wine produced is very great, far exceeding the average. It is however, generally speaking, of very inferior quality. The best wines are the red and white wines of Les Vallées. The gardens and orchards occupy above 16,000 acres. Some cider is made in the arrondissement of Melun. The woods occupy about 200,000 acres, of which 40,000 are included in the forest of Fontainebleau, which occupies a poor yet picturesque district. The oak timber of this forest is very good, and it abounds in game.

The department is divided into five arrondissements, as follows:—

Name.	Situation.	Area in Square Miles.	Cantons.	Communes.	Population. 1831.	Population. 1836.
Melun	W.	390	6	105	57,697	57,821
Fontainebleau	S.	521	7	104	69,953	71,974
Meaux	N.	463	7	161	93,417	90,965
Coulommiers	N.E.	355	4	80	53,363	54,104
Provins	E.	452	5	106	49,463	51,017
		2181	29	556	323,893	325,881

In the arrondissement of Melun are—Melun (population in 1831, 6604 town, 6623 whole commune; in 1836, 6846), on the Seine [MELUN]; Chaulmes, and Brie-Comte-Robert, population 2658 town, 2762 whole commune, on or near the Yères; and Tournan, population 1607 town, 1827 whole commune, between the Yères and the Marne. Chaulmes is surrounded by pleasant country-houses, and has a population of from 1500 to 2000. There are three yearly fairs. Brie-Comte-Robert derives its distinctive epithet from Robert, Count of Dreux, brother of Louis VII., and lord of the town. Robert, son of this Count, built the castle of Brie, of which the ruins remain. This castle was in the middle ages the object of frequent attack. It was stormed by the English in 1430, and retaken by treachery, A.D. 1434. It was taken by the insurgent nobles in the revolt of La Praguerie against Charles VII., and retaken soon after by the king, A.D. 1440. It was again taken in the troubles of the Fronde, in the minority of Louis XIV. The remains of the castle consist of the walls, forming a quadrangular enclosure, with round towers at the angles, and towers, round or square, in the middle of three of the sides. The tower in the centre of the northern face is a gate-tower in good preservation, about 100 feet high; the tower on the south side, which has been like it, is now in ruins. There is an elegant church of Gothic architecture; the portal is a restoration of later date. There is also an hospital, almost as antient as the church. The town is pleasantly situated, and has a considerable weekly market. There are brick-yards and tile-yards, tan-yards and curriers' shops. Considerable trade is carried on in corn, quills, and Brie cheese. Tournan is a pleasant town, with two fine mansions and parks, and several country-houses in the environs. Trade is carried on in cattle, corn, flour, and wool.

In the arrondissement of Fontainebleau are—Fontainebleau (population in 1831, 8104 town, 8122 whole commune; in 1836, 8021 commune), near the left bank of the Seine [Fontainebleau]; Nemours, population 3839; and Moret, population 1673, on the Loing; Château-Landon, near the Suzain; Beaumont, in the south-west corner of the department, between the Essonne and the Suzain; Egreville, between the Bez and the Lunain; and Montereau-Fault-Yonne, population 4048 town, 4153 whole commune, at the junction of the Seine and the Yonne. Nemours was taken by the English in the fifteenth century, and retaken, A.D. 1437, by the French. It was the scene of many disorders in the religious troubles of the sixteenth century. The town lies in a pleasant valley on the river Loing. From its low situation it is subject to inundations. It is walled, and has four suburbs: the streets are well laid out, and the houses well built. The antient castle of the dukes of Nemours is yet standing, flanked by four towers, and surrounded by a ditch. In front of the castle is a square of some extent. The banks of the Loing canal, which passes near the town, and of the river, afford some pleasant walks. There is a handsome bridge over the river, built after the design of the architect Peyronnet, and another bridge over the canal. The parish church, formerly the conventual church of the Augustinian friary of St. Jean, is a large and handsome building, with a fine steeple; but it yields in antiquity to the church of St. Pierre in one of the suburbs. There is an hospital attended by the Sisters of Charity, with a handsome entrance. There are several tan-yards and hat manufactories, tan-mills, flour-mills, a brick and tile-yard, lime-kilns, marble-works, and a brewery. Vinegar is made, and trade is carried on in corn, flour, wine, cheese, wood, iron, coal, &c. There are two considerable weekly markets and five yearly fairs. There is a public library of 10,000 volumes deposited in the castle. Moret is surrounded by a dilapidated wall with three gates: there is one suburb. Moret has a ruined castle, which belonged to the great Sully, and a tolerably handsome Gothic church, at the dedication of which St. Thomas-à Becket officiated. The streets are straight and clean, and the houses tolerably well built. There are several flour-mills and some tan-mills; and trade is carried on in horses, cattle, wine of middling quality, corn, flour, potatoes, wood, and paving-stones. The Loing canal passes close by the town. Moret was taken by the English and Burgundians, under Henry V. and Philippe, duke of Bourgogne, A.D. 1420, and retaken by the French, A.D. 1430. Château-Landon is situated on a hill. There are quarries in the neighbourhood of hard stone susceptible of a polish like marble. Spanish white is made in the town, and trade is carried on in corn and wine. There are a weekly market and five yearly fairs. It was taken by the English in 1436, and retaken the following year. Egreville has a castle rebuilt in the reign of François I. There are some tile-works, and the neighbourhood produces wine, wood, and especially corn. Montereau-Fault-Yonne, or Faut-Yonne, is on the site of an antient town called in the Roman times Condate. It afterwards obtained the name of Monasteriolum, or 'the Little Monastery,' from a religious establishment which formed the nucleus of the modern town; from this name that of Montereau is derived. Montereau has acquired historical celebrity from being the scene, in A.D. 1419, of the assassination of Jean sans Peur, duke of Burgogne or Burgundy. [Bourgogne.] The town and a strong castle which had been built here, were taken, A.D. 1420, by the English under Henry V., assisted by Philippe, duke of Bourgogne, son of Jean; it was retaken by the French, A.D. 1438. In the civil wars of the sixteenth century it was repeatedly taken and retaken. On February 18, 1814, a body of allied troops (Würtembergers) were defeated here by Napoleon. The town is pleasantly situated partly on the left bank of the Seine and Yonne, partly on the tongue of land between the two rivers, over each of which, at their junction, there is a stone bridge, and partly on the right bank of the Seine. There are a collegiate church of considerable antiquity, a modern town-hall, and an hospital. The houses are tolerably well built, and there is a pleasant public walk by the Yonne. Earthenware, tiles and other pottery, and leather are manufactured; and trade is carried on in corn, flour, and firewood, for the supply of Paris. There is a well attended weekly market, held in the spacious market-place, for corn and cattle, and there are two yearly fairs. Potters'-clay is dug near the town.

In the arrondissement of Meaux are—Meaux, population in 1831, 8481 town, 8537 whole commune; in 1836, 7809 commune [Meaux]; La Ferté-sous-Jouarre, population 2777 town, 3927 whole commune; and Lagny, population 1865 town, 1869 whole commune, all on the Marne: Crécy, on the Grand Morin; and Dammartin, population 1654 town, 1712 whole commune; and Crouy, between the Marne and the northern boundary of the department. La Ferté-sous-Jouarre is pleasantly situated in the valley of the Marne, in which river there is a small island close to the town. Round the town are a number of country seats and houses, and near it, on the right bank of the Marne, is the castle of Barre, flanked with towers, and commanding a beautiful prospect. There is an hospital. The chief trade is in the excellent millstones which are quarried near the town, and which are esteemed the best in Europe. For the iron-work, *i.e.* the tires or bands of these, about fifty tons of iron are required yearly. Woolcombers' cards, leather, iron, woollen yarn, tiles, and pottery are made; and boats are built for the navigation of the river. There are lime and plaster kilns and nursery-grounds near the town. Trade is carried on in corn, wood, and charcoal, for the supply of Paris; and in cattle, sheep, and wool. There are four yearly fairs, one of them a large sheep-fair. La Ferté-sous-Jouarre was one of the chief seats of Protestantism: it suffered much in the wars of the League. Lagny was antiently celebrated for a Benedictine abbey, founded in the seventh century by St. Furcy, a Scotchman, and which, after being pillaged by the Normans in the ninth century, was restored by Herbert, count of Champagne. Lagny was taken and burnt in 1358 by the English, in the wars of Edward III. It was besieged by them in A.D. 1431, and again in A.D. 1432, under the regent Bedford, but without success, though the town was much injured. Some disturbances having occurred in the reign of François I., the town was occupied by a body of troops under the Maréchal de Lorges, who committed such devastations that his name was long held in detestation. The town is pleasantly situated on the left bank of the Marne, over which there is a bridge, amid vine-covered hills and green pastures. There are a handsome fountain, an hospital, and an institution for the relief of the poor. There is a workshop for cutting the alabaster procured in the department, and there are several flour-mills. Considerable trade is carried on in corn, flour, wood, hemp, cattle, and Brie cheese: there are a weekly market and four yearly fairs. Crécy was, in the middle ages, a fortress of some importance. Its castle, of which there are some remains, belonged to the counts of Champagne and Brie, and was one of the strongest in the neighbourhood. The town was defended by walls flanked by ninety-nine towers, of which there are some remains. It is pleasantly situated on the Grand Morin, which is here divided into several channels. It has a bridge over the river, and an hospital. Laces, hats, and chamois and other leather are manufactured; there are some tan-mills; and considerable trade is carried on in corn and other agricultural produce and cattle. There are three well frequented yearly fairs. Dammartin is on the slope of a hill which commands an extensive prospect. There are some pleasant walks, occupying the site of the former castle of the counts of Dammartin, the ruins of which furnished bricks for building many of the houses of the town. There is a Gothic church, built by Antoine de Chabannes, lord of Dammartin and minister of Charles VII. He is buried in the choir. There is an hospital. Lace is made here, and trade is carried on in corn, wine, and cattle. There are four yearly fairs, at one of which, held on Whit-Monday, it is estimated that 30,000 sheep, chiefly merinos, are sold. Crouy is in a pleasant valley near the left bank of the Ourcq, and has a large market-place with a tolerably good market-house. It has a weekly market and three yearly fairs: trade is carried on in corn, hemp, cattle, and poultry. The neighbourhood has a number of country-houses: one tower of the antient castle of Crouy is yet standing, and is used as a prison.

In the arrondissement of Coulommiers are—Coulommiers, population in 1831, 2645 town, 3335 whole commune; in 1836, 3573 commune; and La Ferté-Gaucher, population 1553 town, 1930 whole commune, on the Grand Morin; Rebais, between the Grand Morin and the Petit Morin; Choisy, between the Grand Morin and the Aubetin; and Rosoy, on the Yères. Coulommiers received a charter of municipal enfranchisement in 1231, from Thibaut IV., count of Champagne: it suffered much in the civil dissensions which preceded and accompanied the English wars under Henry V. and Henry VI., but revived on the restoration of peace. In the early part of the seventeenth century, the duchess of Longueville, who held the lordship of Coulommiers, built a castle, and a Capuchin monastery adjacent to it, in an island formed by the Grand Morin: the ruins of the castle and the elegant church of the monastery yet remain. There is an hospital. There are many tan-yards and tan-mills. Coulommiers has a weekly market and two yearly fairs; much business is done, especially for the supply of Paris with corn, flour, cheese, wool, leather, and melons, which last are considered very good. Coulommiers has a subordinate court of justice; and there are many schools for young people of both sexes, the town being recommended by its healthy and agreeable situation. La Ferté-Gaucher is agreeably situated; it has an hospital of antient foundation. Serge and paper are manufactured; there are tan-yards, a tan-mill, and in the neighbourhood tile-yards and lime-kilns; there are a weekly market and four yearly fairs. Rebais was antiently celebrated for an abbey which, in the middle ages, was remarkable for riches and splendour: it was suppressed at the Revolution, and the buildings destroyed; there are some ruins of them and of a house in which the abbot resided. There is also an antient hospital. Gaiters are made here, and trade is carried on in mustard, wool, cattle, and especially in corn; there are nursery-grounds and brick-yards and tile-yards round the town. Rebais has a weekly market and five yearly fairs. Choisy had antiently an establishment of Cluniac monks, whose monastery is yet standing: the town was a place of strength; there are some remains of the walls and ditches. Tiles are made here, and there are two yearly fairs. Rosoy or Rosay, sometimes written Rozoy or Rozay, is a walled town; the walls are flanked with towers, and planted with fine trees. It has a parish church remarkable for the rich and delicate architecture of the interior, and an hospital established in a former convent of Dominican friars. Seed-oil and vinegar are made, and there are three yearly fairs.

In the arrondissement of Provins are—Provins, population in 1831, 5665; in 1836, 6007; Nangis, population 1963; Donnemarie and Chalautre, between the Seine, the Yères, and the Aubetin; Jouy-le-Châtel, near the Yères; and Bray, population 1992, on the Seine. Provins is a town of considerable antiquity; some writers contend for its being the Agedincum of Cæsar (see *Dissertatio de Urbe Agedinco*, subjoined to the first volume of Cæsar, in Lemaire's *Bibliotheca Classica Latina*, Paris, 1819); but Dulaure affirms that Provins is not mentioned before the year 802, and stoutly denies its identity with Agedincum, in which we are inclined to agree with him. In the middle ages this was one of the principal manufacturing and trading towns in France; the chief manufactures were of woollen cloth (in which, in the thirteenth century, 3000 weavers and as many wool-carders and fullers are said to have been employed) and leather. Three very large fairs, whose aggregate duration was more than four months, were held. Foreign merchants, who resorted to these fairs, had their halls, named after the province or country from which they came; and some old mansions in Provins yet retain these names. The cruelties and exactions of the king of France (Philippe le Hardi) and of the earl of Lancaster, who had married the heiress of Champagne and Brie, and was lord of the town, ruined the prosperity of Provins, which was still further injured by assaults and captures in the civil and English wars of the fifteenth century, and in the war of the League in the sixteenth. Provins occupies an extensive area, part of which consists of gardens, vineyards, and even fields; and is divided into two parts, the Upper Town on the west side, surrounded by walls, of which the greater part are standing; and the Lower Town on the north east, east, and south-east, also surrounded by walls, except where it is adjacent to the Upper Town. These walls, which have breaches in several places, are very thick; they are, in the greater part of their circuit, accompanied by a deep ditch and by a boulevard or planted walk; that part of the boulevard which belongs to the Lower Town is inside the walls, and the small part which belongs to the Upper Town is outside. Two small streams, the Vouzie and the Durtein (which joins the Vouzie), pass through the town. The Upper Town is inhabited only by a few persons of the poorer class: the streets are narrow and winding, and the houses ill built and decayed from age. There are several remarkable ruins, among which are those of the old fort, the citadel, the old castle, La Grange-aux-dîmes, Le Pinacle, the chapel of St. Thibaut, and the church of Notre-Dame-du-Château; and especially of the Great tower, called also the King's tower, Cæsar's tower, and recently the tower of St. Quiriace, from the saint to whom an adjacent church is dedicated. This tower stands on the highest ground in the town, and is further elevated by an artificial mound 16 feet high. On this mound is raised a circular terrace or platform, supported by a strong wall, and from this platform rises the tower, which is square, with smaller round towers at the angles; these round towers rise above the walls, and are crowned with conical roofs. From the centre of the square tower rises a smaller octagonal tower connected by flying buttresses with the towers at the angles, and crowned, like them, with a high peaked roof. The whole building is above 120 feet high. The church of St. Quiriace, now the parish church of the Upper Town, is remarkable for its size and the beauty of its architecture: the choir has the same dimensions as that of the cathedral of Notre Dame at Paris. It was begun in the twelfth century, but has never been completed. The Upper Town is further remarkable for the spacious and lofty vaulted cellars which are found under some of the houses: some have a second cellar below the first; others have wells or tanks supplied by springs, and are often connected with each other by long subterranean passages. The palace of the counts of Champagne, near the church of St. Quiriace, is now occupied by the college. The Lower Town, which is well laid out and well built, contains two churches, the parish church of Sainte Croix, and the succursale, or chapel-of-ease, of St. Ayeul or Ayoul; the general hospital for the aged, and for orphans and foundlings, which occupies the ex-nunnery of St. Catherine, belonging to the Cordelier nuns, or nuns of St. Clare; and the cavalry barracks. Besides these buildings Provins has a civil and military hospital, a school of mutual instruction, a large corn-market, and several fountains. It has also a society of agriculture, sciences, and arts; and a subordinate court of justice: the public library, which consisted of 10,000 volumes, was destroyed by fire, A.D. 1821. The manufactures are druggets and linsey-woolsey, earthenware, and conserve of roses. The Provins roses, from which the conserve is made, were brought from the East in the thirteenth century by Thibaut, count of Champagne, on his return from the crusade. Provins has also a brewery, tan-mills, tan-yards, tile-yards, lime-kilns, and about sixty flour-mills. The chief articles of trade are corn and flour for the supply of Paris, wool and leather, and roses for use in medicine and perfumery. A canal was begun in 1780, to communicate with the Seine at Bray, but it remains unfinished. There are chalybeate waters, diuretic and purgative, tolerably well frequented in the season. There is a weekly market and there are five yearly fairs. Nangis is pleasantly situated in a bottom. It has a Gothic church of solid architecture; and two towers, the remains of the antient castle of the marquises of Nangis: the park attached to the castle still remains. Leather is made; and a considerable trade carried on in wool, cattle of every kind, corn, Brie cheese, butter, eggs, poultry, fruit, pulse, and other agricultural produce, for the supply of Paris. There are two yearly fairs and a considerable weekly market. Donnemarie is pleasantly situated; it has tan-yards, tile-yards, lime-kilns, and two considerable yearly fairs. Jouy-le-Châtel has the ruined donjon or keep of its antient castle. Bray, distinguished as Bray-sur-Seine, is on the left bank of the Seine, over which there is a stone bridge. It has two yearly fairs; and trade is carried on in corn, hay, cattle, and fish.

The population, when not otherwise described, is that of the commune, and from the census of 1831.

This department constitutes the diocese of Meaux, the bishop of which is a suffragan of the archbishop of Paris. It is included in the jurisdiction of the Cour Royale and of the Académie Universitaire of Paris: and is in the first military division, the head-quarters of which are in the same city. It returns five members to the Chamber of Deputies. In respect of education it is decidedly above the average of the departments: of the young men enrolled in the military census of 1828-29, 54 in every 100 could read and write, the average of the departments being a little more than 39.

In the most antient historical period, this part of France was included in the territories of the Senones, the Parisii, the Meldi, and perhaps the Silvanectes. The last nation probably belonged to the great Belgic stock; the others were Celts. The Parisii inhabited the north-western side of the department; the Meldi, whose name Ptolemy writes *Μέλδαι*, the north-eastern; and the Silvanectes, if indeed they extended into this department, just the north-western extremity about Dammartin. The name of this last people is variously written. The orthography we have given is that of the Notitia Provinciarum Galliae: in the Notitia Dignitatum per Gallias, the name is applied to the chief town in the form Silvanectae. They appear to be the same people as the Ulmanetes of Pliny, and the *Σουβάνεκτοι* or *Σουμάνεκτοι* of Ptolemy. The southern half of the department belonged to the Senones. The Silvanectes were included in the province of Belgica Secunda; the other nations in that of Lugdunensis Quarta, or Senonia.

The principal Gallic or Roman towns were Jatinum, or, in the Peutinger Table, Fixtuinum, capital of the Meldi, or Meldæ, whose name it subsequently took; whence is derived its modern designation of Meaux. The Calagum and Riobe of the Peutinger Table were probably both in the territory of the Meldi, and may be identified with the village of Chailly near Coulommiers, and Orbi between Nangis and Jouy-le-Châtel. In the territories of the Senones were Melodunum, or Metiosedum (Cæsar writes the name apparently both ways), the Mecletum or perhaps Methetum of the Antonine Itinerary, and the Meteglum of the Peutinger Table, on an island of the Seine opposite Melun; and Condate, now Montereau-Faut-Yonne.

In the middle ages this part of France was included partly in the Ile de France, partly in Champagne. The eastern parts, which belonged to Champagne, were included in the district of Brie Champenoise; the western parts, which belonged to the Ile de France, were included in the district of Goelle, which belonged to the Ile de France properly so called; and in the districts of Brie Française and Gatinais Français. It was the scene of warfare during the long struggle to expel the English in the time of Charles VII.; and many of the towns were taken and retaken in the course of the contest.

SEINE ET OISE, a department of France, bounded on the north by the department of Oise, on the east by that of Seine et Marne, on the south by that of Loiret, on the west by that of Eure et Loir, and on the north-west by that of Eure. The department of Seine is entirely enclosed by this department. The form of the department of Seine et Oise is compact: the greatest length is from the banks of the Epte below St. Clair, in the north-west, to the junction of the three departments, Loiret, Seine et Oise, and Seine et Marne, on the south-east, 70 miles; the greatest breadth at right angles to the length is from the junction of the three departments of Oise, Seine et Oise, and Seine et Marne, on the north-east, to the western border of the department, between Houdan and Epernon, 52 miles. The area of the department is estimated at 2169 square miles, being under the average area of the departments of France, and rather greater than the conjoint areas of the English counties of Wilts and Berks. The population in 1831 was 448,180; in 1836 it was 449,582, showing an increase in five years of only 1402, or less than 0·3 per cent., and giving 207 inhabitants to a square mile. Both in amount and density of population it is considerably above the average of France, and also superior to the English counties with which we have compared it. Versailles, the chief town, is 11 miles west-south-west of Paris through Sèvres.

The surface is undulating, but none of the hills are of sufficient height or importance to claim particular notice. A narrow strip along the western border is occupied by the formations of the cretaceous group; and the rest of the department by the tertiary formations of the chalk basin of Paris. Its mineral productions are not important: there is neither iron nor any other metal, nor coal: excellent freestone for building, lithographic stones, sandstone for paving, gypsum, chalk, marl in tolerable quantity, potters'-clay, both for porcelain and common earthenware, and peat are dug. There are mineral waters at Enghien-les-Bains, in the valley of Montmorency, 12 or 13 miles north of Paris, well frequented in the season; and at Montlignon, in the same neighbourhood: those of Montlignon are chalybeate; those of Enghien are sulphurous.

The whole department belongs to the basin of the Seine, which river enters the department on the east side, not far from Corbeil, and flows through it in a north-western direction, but with many remarkable bends, until it finally quits it below the junction of the Epte. All the course of the river between these points does not however belong to this department, but part of it belongs to that of Seine, which as already observed, is enclosed by this. The Marne has a small part of its course in the eastern part of this department; and the Oise flows for some miles through the northern part, from above Beaumont-sur-Oise to its junction with the Seine. These are the principal rivers: and all three of them are navigable throughout that part of their course which belongs to this department. Of smaller streams, the Yères and the Epte flow into the Seine on the right bank, and the Essonne and the Orge on the left: in the western part of the department, the Vesgre flows into the Eure, a tributary of the Seine, no part of whose course belongs to this department.

The only navigable canal is the Ourcq Canal, which crosses the east side of the department, from the department of Seine et Marne to that of Seine. The canal parallel to the Oise will have part of its course in this department; and a canal from Pontoise to Paris has been projected. The Maintenon Canal was intended to bring the waters of the Eure to Versailles, but has never been finished. The official statement of the inland navigation of the department is as follows:—

Rivers.	Miles.	
Seine . .	87	
Marne . .	6	
Oise . .	26	
		— 119
Canal.		
Ourcq . .		6
		125

There were, on Jan. 1, 1837, twenty-six Routes Royales or government roads, having an aggregate length of [illegible] miles, viz. 353 miles in good repair, 85 miles out of repair, and 9 miles unfinished. The principal are those from Paris by Beaumont-sur-Oise, to Beauvais and Calais; from Paris by Luzarches, to Clermont and Amiens; from Paris to Lille and Mons, with a branch by Louvres to Peronne and Cambray; from Paris to Châlons-sur-Marne and Strasbourg; from Paris to Dijon and Geneva; from Paris, by Villeneuve St. Georges, to Auxerre and Lyon, and by Corbeil to Moulins and Lyon (of all which roads only a small portion is in the department); from Paris, by Montlhéry, Arpajon, Etréchy, Etampes, and Angerville, to Orleans and the south of France; from Paris, by Versailles and Rambouillet, to Chartres, Tours, and the south-west of France; a second road to Chartres, by Rochefort, St. Arnould, and Ablis, and a road by Versailles and Houdan to Alençon and the west of France; and roads from Paris, by St. Germain, Poissy, Meulan, and Mantes, to Evreux and Caen; and from Pontoise on one hand to Rouen, and on the other to Dieppe. The departmental roads had at the same time an aggregate length of 413 miles, viz. 346 miles in good repair, 63 miles out of repair, and 4 miles unfinished. The bye-roads have an aggregate length of about 9000 miles.

The climate is temperate and healthy; the soil, generally speaking, sandy, and by no means fertile by nature, is rendered productive by the facility which Paris presents of obtaining manure, and by the stimulus given to cultivation by the proximity of so ready a market as the capital. The area of the department may be estimated in round numbers at 1,400,000 acres, of which about 920,000 acres, or about two-thirds, are under the plough. The principal grain cultivated is wheat, in which, as well as in barley, the produce is double the average produce of the departments: in rye and maslin (wheat and rye mixed) the produce is above the average; but in oats it falls very considerably below the average. Very few potatoes and but little buckwheat are grown; and of maize scarcely any. Pulse of every kind and hemp are cultivated.

The meadow and grass lands amount to 50,000 acres, there are about 25,000 acres of heath or open pasture. The number of horses is very considerable; they are employed in almost all agricultural labours. The ass is common. The number of cows is very great, more than double the average number in other departments; their milk contributes to supply Paris: the number of oxen and of bulls is small. Sheep are very numerous; even in the number of those of the indigenous breeds the department is above the average; and in the number of merinos and cross-breeds it is very far above it. It was at Rambouillet, in this department, that the merino was first naturalised in France; and the flocks of that neighbourhood are still daily contributing to the improvement of the breed of sheep throughout France. The long-wooled English sheep have also been naturalised, and have been propagated to a considerable extent.

The vineyards occupy about 40,000 acres: they are exceedingly productive, but the wine is for the most part of inferior quality. The red wines grown at Andrésy, on the right bank of the Seine, just below the junction of the Oise, round Mantes, and at Athis, on the Seine, above the junction of the Yères, are considered pretty good: that of Argenteuil, which was once in high repute, has degenerated: the white wine of Mignaux, near Lonjumeau, is also tolerably good. The gardens and orchards occupy 19,000 acres. The apple and pear are cultivated in the north-western corner of the department, where the vine does not thrive, to produce the cider and perry which form the common drink of the inhabitants. The cherries of Montmorency and Vilaines near Poissy, the figs of Argenteuil and Carrières, both on the right bank of the Seine, the gooseberries of Garches near St. Cloud, and the strawberries of Montlhéry, are much esteemed.

Poultry is not very abundant; and game, once plentiful, has become rare. Bees are kept in considerable number in some places. The streams and pools abound with fish, especially the trout, eel, carp, pike, and perch; the tench, barbel, roach, gudgeon, and bleak are taken, the last for its scales, which are used in the manufacture of false pearls. Cantharides, or Spanish flies, and leeches, are obtained in some places, and form an article of trade.

The department is divided into six arrondissements, as follows:—

Name.	Situation.	Area in Sq. Miles.	Cantons.	Communes.	Population in	
					1831.	1836.
Versailles	Central	328	10	114	130,741	133,551
Mautes	N.W.	339	5	127	60,785	60,290
Rambouillet	W.	513	5	119	66,116	66,514
Corbeil	E.	248	4	94	56,753	56,738
Pontoise	N.E.	431	7	164	92,577	91,427
Etampes	S.	310	4	69	41,208	41,062
		2169	35	687	448,180	449,582

A later account gives the number of cantons (districts, each under a justice of the peace) at 36: we know not in which arrondissement the addition has been made.

In the arrondissement of Versailles are—Versailles (pop. in 1831, 28,477; in 1836, 29,209), on the great western road [VERSAILLES]; Argenteuil, pop. 4542 [ARGENTEUIL]; and Meulan, pop. 1850, on the right bank of the Seine: and Meudon, pop. 1775 town, 3026 whole commune; Sèvres, pop. 3973; St. Cloud, pop. 1935 [CLOUD, ST.]; Marly; Ruel, pop. 3417; St. Germain-en-Laye, pop. 10,671 [GERMAIN, ST.]; and Poissy, pop. 2850, on or near the left bank. Meulan was frequently contested in the wars of the English in France, and in the civil strife of the Armagnacs and Bourguignons. A fort built on an island of the Seine opposite the town was vainly besieged by the Duke of Mayenne in the wars of the League. The town is partly on the right bank of the river, on a rising ground, partly in the small island on which the fort stood, from which are two bridges to the opposite banks: it is tolerably well built, and has a parish church; another church, now desecrated and used as a corn-market; and an antient hospital. Woolcombers' cards, woollen yarn and cloth, leather, hosiery, and chemical productions are manufactured; there are many flour-mills; and trade is carried on in cattle, corn, leather, mercery, and hardwares. There are two yearly fairs. Stone is quarried in the neighbourhood. Meudon was celebrated for an antient château, occupied at different times by the Cardinal of Guise, and by Louvois, minister of Louis XIV. In the early period of the Revolution it was devoted to the trial of improvements in the construction of artillery; and having been much injured by the works carried on, was demolished in 1804. A second palace, built in the reign of Louis XIV. by the second Dauphin, his grandson, was made an imperial residence by Napoléon, and is yet standing: it commands an extensive prospect. There are several country-houses at Meudon, and a glass-house and a pottery in Lower Meudon, on the banks of the river. Rabelais was appointed curé, or parish priest, of Meudon, but never discharged the duties. Sèvres consists chiefly of one very long street, on the road from Paris to Versailles; the houses are generally well built. There is an antient Gothic church. The royal porcelain manufactory occupies an immense building: it comprehends a collection of specimens of foreign porcelain, and of the raw materials of which they are made; of all the varieties of French porcelain, earthenware, and pottery, with the raw materials of these; and a third collection of specimens of works produced in the manufactory itself, chronologically arranged. Porcelain-clay is dug in the neighbourhood. Articles of enamel, chemical products, earthenware, and Cashmere shawls are made at Sèvres; and there are a tan-yard, a brewery, and a refining-house for oil. Considerable trade in wine and other articles is carried on. There is a bridge over the Seine. There was some sharp fighting between the French and Prussians here in 1815. Marly had formerly a royal palace and gardens, now destroyed: it is remarkable for its forcing-pump and aqueduct for the conveyance of water to Versailles: the pump raises the water to the height of above 500 feet. Ruel contains the palace of Malmaison, the residence of the empress Josephine before and after her divorce. She died here in 1814, and the palace was pillaged by the allies in 1815. Josephine's tomb is in the church of Ruel. There are also here a palace built by Cardinal Richelieu, and extensive barracks. The early kings of the Capet family had a palace at Poissy, and St. Louis was baptized, if not born, in that town. It suffered in the wars of the English; and in 1561 a celebrated conference, 'the Colloquy of Poissy,' was held there between some of the Catholic clergy and some of the Reformed with Theodore Beza at their head. The town is old and ill built, with narrow, crooked, dirty streets, and a large but irregular market-place: there is a very long narrow bridge over the channels and islands of the Seine. Some parts of the old town-wall are yet standing. The parish church is a fine Gothic building of considerable antiquity. The font in which St. Louis was baptized is preserved in a chapel, the painted windows of which represent his birth. There are an antient hospital at Poissy, and a house of correction, in which the prisoners are kept to hard labour. The manufacture of soda, soap, and muriatic acid; tallow-melting, grinding corn, and the making of light hats of whalebone and osier, are carried on: there are three weekly markets, one a great cattle-market for the supply of Paris; and there is some trade in corn. The village of St. Cyr, near Versailles, has a military school. [CYR, ST.]

In the arrondissement of Mantes are—Mantes, pop. in 1831, 4148; in 1836, 3818; Limay, and Roche-Guyon, on the Seine; St. Clair, on the Epte; Magny, on the road from Paris to Rouen; and Houdan, pop. 1839, on that from Paris to Alençon. Mantes was, in the infancy of the French monarchy, one of its bulwarks towards Normandie. It was taken and burned, A.D. 1087, by Guillaume or William the Conqueror, who died from a hurt received here. It suffered repeatedly in the English wars in the fourteenth and fifteenth centuries; and had some share in the troubles of the Fronde in the seventeenth. The town is well situated on the left bank of the Seine, and communicates by two handsome stone bridges (connecting the banks of the river with an intervening islet) with the village or town of Limay on the opposite bank, which, though a separate commune, may be regarded as a suburb of Mantes, the population of which it raises to between 5000 and 6000. The houses are well built, and the streets are adorned by four fountains. There are pleasant walks, some on the banks of the Seine. The church is a fine Gothic building, with two lofty towers; and there are an antient tower, which is the remain of an old church of St. Maclou; two hospitals, one for the sick, the other for the aged; and a public library of 4000 volumes. Saltpetre, leather, especially excellent calfskin, coarse linens and hosiery, are made: there are numerous tan and flour mills, and trade is carried on in wine, leather, and corn. There are six yearly fairs. La Roche-Guyon is on the right bank of the river, and is commanded by a precipitous rock or cliff surmounted by an antient tower. Immediately at the foot of the cliff is a castle or mansion, partly antient, partly modern, communicating with the town by a subterraneous staircase cut in the rock. St. Clair, distinguished as St. Clair-sur-Epte, is the place where Charles the Simple signed the treaty surrendering Normandie to Rollo the Northman. [NORMANDIE.] It has the remains of a baronial castle, a hermitage (said to have been the residence and place of martyrdom of St. Clair in the ninth century), the fountain of which is much resorted to for the cure of sore eyes. Magny is in the valley of the Aubette, a small stream flowing into the Epte; it is well built, and there are some pleasant country-houses around. There are an old parish church and an hospital. Hosiery and leather are manufactured; and trade in cattle, corn, and hides is carried on. There are two yearly fairs and a weekly market. Houdan, at the confluence of two small streams which join the Eure, has an antient church, an old tower of unknown origin and singular form, and a great trade in corn, calves, poultry, and wool. There are a weekly market and three considerable yearly cattle-fairs.

In the arrondissement of Rambouillet are—Rambouillet pop. in 1831, 2522 town, 3147 whole commune; in 1836, 3006 for the commune; on the road from Paris to Chartres; Montfort L'Amaury, pop. 1817, between the road to Chartres and that to Alençon; St. Leger, on the Vesgre, which joins the Eure; Limours, Rochefort, St. Arnould, and Ablis, on the second road to Chartres; and Chevreuse, pop. 1507, between the two roads from Paris to Chartres; and Dourdan, pop. 2393 town, 2555 whole commune, on the Orge, a small feeder of the Seine. Rambouillet has a royal château, partly built of brick, and of the time of Henri IV., partly of older date, especially a round tower in which François I. died: the park and gardens were laid out by Le Nôtre. There is a large wood stocked with game. It was at Rambouillet that Charles X. attempted to rally his troops after 'the three days' at Paris (in 1830), but the advance of the Parisians compelled him to withdraw. There is a royal sheepfold, established by Louis XVI., who also established a model farm. It was here that the merino sheep was first naturalized. Sheep-farming, and especially the breeding of merinos, is pursued by several persons. There are a town-hall, built by Louis XVI., and an hospital. Sandstone is quarried in the neighbourhood; and there are two weekly corn-markets, one of them very considerable, and three yearly fairs, one especially for wool. Montfort-l'Amaury is tolerably well built, on the slope and at the foot of a small hill, the summit of which is crowned by the ruins of an old castle. The parish church is a large Gothic building with stained glass windows: there is an hospital. Trade is carried on in corn, cheese, fruit, cattle, and horses: there are four yearly fairs. At Limours pottery is made, millstones are quarried, and trade in corn is carried on: there are two yearly fairs. The church is large and well built: there was formerly a mansion, which belonged to Diana de Poitiers, to Cardinal Richelieu, and to Gaston, duke of Orléans, brother of Louis XIII. Rochefort has the remains of an antient fortress. Cotton yarn is spun here. At St. Arnould or Arnoult, sometimes distinguished as St. Arnoult-en-Yvelines, cotton-spinning and weaving are carried on, and there are bleach-grounds. Some remains of the antient fortifications of the town still exist. Ablis has two yearly fairs for cattle, mercery, and hardwares. Chevreuse has tan-yards; a considerable trade in corn, cattle, and wool is carried on; and there is a considerable tile and brick-yard near the town. Four yearly fairs are held. There are some ruins of an old castle. The town suffered much in the civil and English wars of the fifteenth century. Dourdan was formerly a place of strength: it retains the ruins of a very antient castle, lately occupied as a house of correction; and there is an antient church, with a central tower remarkable for its height, and two other towers at the west end. Silk stockings, coarse woollens, cotton-yarn and cotton goods, and beer are made; and trade is carried on in corn, wool, and woollen cloth. La Bruyère was born near Dourdan. Dourdan has a house of correction.

In the arrondissement of Corbeil are—Corbeil, pop. in 1831, 3708; in 1836, 3690; at the confluence of the Essonne with the Seine; Villeneuve St. Georges, at the junction of the Yères with the Seine; and Longjumeau, pop. 2038 town, 2308 whole commune; Montlhéry, pop. 1547 town, 1566 whole commune; and Arpajon, pop. 2165, on the road from Paris to Orléans. Corbeil was a place of some importance in the earlier periods of the French monarchy: Abelard resided and taught here for a short time. It was repeatedly attacked in the English and domestic wars of the fourteenth, fifteenth, and sixteenth centuries. The town is divided into two parts by the river Seine; Vieux or Old Corbeil, on the right bank, is the smaller part, and is regarded as a suburb of the more important part, Neuf or New Corbeil, on the left bank; the two are united by a good stone bridge. There is another stone bridge over the Essonne, which here joins the Seine. There are several churches, an hospital, a prison, a theatre, a corn-market, and a flour-magazine. There are one or two government offices, and an agricultural society. Cotton-yarn, printed calicoes, paper, leather, glue, refined sugar, and pipes or hoses for engines, woven in flax and hemp without seam, are made. The chief trade is in corn and flour for the supply of Paris, cattle, and horses. There are more than forty flour-mills on the Essonne. There are two weekly markets and one yearly fair. Villeneuve St. Georges is built on the summit and slope of a pleasant hill. There are a sugar-refining-house, a tile-yard, an oil-store, and wine-stores. Lonjumeau, or Longjumeau, has some large tan-yards, and a considerable trade in corn, flour, wine, fruit, pulse, hides, and cattle. There are four yearly fairs. Montlhéry is memorable for the battle fought near it (A.D. 1465) between Louis XI. and Charles le Temeraire, count of Charolais, afterwards duke of Bourgogne, then at the head of the 'Ligue du Bien Public.' [BOURGOGNE.] The town is built on the slope of a hill, of which the summit is occupied by an antient tower, the *donjon* of a former castle. There are also an antient town-hall and hospital. Trade is carried on in cattle, and there are four yearly fairs. Arpajon has tan yards and breweries; and carries on trade in corn, flour, pulse, calves, pigs, poultry, and butter: it has a large weekly market and three yearly fairs.

In the arrondissement of Pontoise are—Pontoise, population in 1831, 4979 town, 5458 whole commune; in 1836, 5405 commune; and Beaumont, population 1892 [BEAUMONT], on the Oise; Marines, on the road from Paris to Dieppe; Montmorency, between the Dieppe and Calais roads; Luzarches, on the Calais road; and Louvres, and Gonesse, population 2147, one upon and the other near the road to Cambray. Pontoise existed in the Roman times, but is little noticed until the ninth century, when a castle was built to check the incursions of the Northmen or Normans. It was repeatedly taken and re-taken in the English wars of the fifteenth century; and was taken by Henri III. and Henri of Navarre in the war of the League. Louis XIV. withdrew to Pontoise during the troubles of the Fronde. The town is built partly on the summit and side, partly at the base of a hill on the right bank of the Oise, over which there is a narrow inconvenient bridge built in the sixteenth century. The streets are generally narrow and winding; those in the lower part of the town are well paved; those which communicate between the upper and lower part are so steep as to require steps in some parts to relieve the difficulty of the ascent. There are two churches, St. Maclou and Notre Dame, standing in large irregular open spaces planted with trees: that of St. Maclou is an antient Gothic church, crowned with a lofty tower. There are some remains of the old town-wall, and of the tower of the antient church of St. Martin. There is an hospital recently built on the banks of the river; and there are a high school, a public library, an agricultural society, a theatre, a school of mutual instruction, and several private schools. Steel ornaments, clocks and watches, mineral acids and other chemical preparations, starch, cotton-yarn, and leather are manufactured; and trade is carried on in corn and flour for the supply of Paris, gypsum, and cattle. There is a copper-foundry. Pontoise has some judicial or fiscal government offices. There are a number of corn-mills on the Oise or on the Viosne, a small stream which here joins the Oise. There are three yearly fairs. Marines has tile and brick yards and plaster-kilns: there are two yearly fairs. Trade is carried on in cattle. Montmorency is on a hill commanding the picturesque and beautiful valley of Montmorency. The streets are steep, but there are some good houses. The market-place is large but irregular, with a market-house in the middle. The parish church is a Gothic building of the sixteenth century. Near the town is the Hermitage, a small house, celebrated as the retreat of Rousseau, and of the musical composer Grétry, who died here in 1813, and is buried in a tomb in the garden. In the valley near the lake of Montmorency are the mineral waters of Enghien, population 1789, which are similar in their character and properties to the waters of Barrèges in the Pyrenees. They are much frequented in the season, which lasts from June to September. There are excellent bathing-rooms; and in the neighbourhood are pleasant walks. The park of St. Gratien is connected with the bathing-rooms. Common lace and embroidery are made at Montmorency, and trade is carried on in fruit of every kind, especially chesnuts and excellent cherries. There is a considerable weekly market. Luzarches has an antient abbey, now converted into a country-house, and an hospital. Metal buttons and lace are manufactured; and trade is carried on in corn and cattle. There are two yearly fairs. Louvres is built partly on the slope of a hill, partly in a valley. Lace and ratafia are made; trade is carried on in cattle; and there are three yearly fairs. Gonosse, or Gonnesse, was the birth-place of PHILIPPE II., AUGUSTE. It has a parish church and an hospital. Fringes, cotton-yarn, linens, and braid are made; and there are bleach grounds for linen: considerable trade is carried on in corn, hay, horses, and cattle: there are two yearly fairs.

In the arrondissement of Etampes are—Etampes, population in 1831, 8109; in 1836, 7896 [ETAMPES], on the Juine, a feeder of the Essonne; Estrechy and Angerville, on the road from Paris to Orléans; La Ferté-Aleps, on the Essonne, and Milly, population 1881 town, 1941 whole commune. At Estrechy, or Etrechy, a considerable trade in horses is carried on. Angerville has a brewery; stockings are manufactured; and trade carried on in corn, cattle, and wool. There are two yearly fairs. La Ferté Aleps, or Alais, is pleasantly situated, and was antiently a place of strength. Cotton-yarn is spun, and trade in horses and cattle is carried on. There are sandstone-quarries near the town. Milly is pleasantly situated, and has a church, an hospital, a market-house, and the ruins of an antient Gothic castle, which stood several sieges in the wars with the English during the reign of Charles VII. Trade is carried on in corn and cattle: there are four yearly fairs, at which much business is done in agricultural produce, especially grain.

The population given above, when not otherwise described, is that of the commune, from the census of 1831.

The department constitutes the diocese of Versailles, and is under the jurisdiction of the Cour Royale and of the Académie Universitaire of Paris: it is in the first military division, the head-quarters of which are at Paris. It sends seven members to the Chamber of Deputies. In respect of education it is considerably in advance of the average of the departments: of the young men enrolled in the military census of 1828-29, 56 in every 100 could read and write; the number in the average of the departments being about 39 in the 100.

In the earliest historical period this part of France was included in the territories of the Parisii, who dwelt in the central and eastern part; the Veliocasses, or Velocasses, in the northern part; the Carnutes in the western; and the Senones in the southern. Some small portions along the northern boundary may have belonged to the Bellovaci and Silvanectes; a small portion of the north-western corner may have belonged to the Aulerci Eburovices, and another small portion of the southern border to the Aureliani. The Parisii, the Carnutes, the Senones, and the Aureliani were included in the Roman province of Lugdunensis Quarta, or Senonia: the Veliocasses and Aulerci Eburovices, in that of Lugdunensis Secunda; the Bellovaci and Silvanectes, who, as well as the Veliocasses, were of Belgic stock, were comprehended in Belgica Secunda. Briva Isarae and Petromantalum or Petrumviaco, both apparently towns of the Veliocasses, and mentioned in the Antonine Itinerary and the Peutinger Table, are identified by D'Anville, the first with Pontoise, and the second with Magny or some position near it. Diodurus, in the territory of the Carnutes, mentioned in the Antonine Itinerary, was probably near Montfort l'Amaury; and Salioclita, in the territory of the Senones, mentioned in the same authority, was probably at Saclas on the Juine, above Etampes.

In the middle ages this territory was included in the provinces of Ile de France and Orléanais.

SEISIN is a term properly applied to estates of freehold only, so that a man is said to be *seised* of an estate of inheritance or for life, and to be *possessed* of a chattel interest, such as a term of years. This distinction does not appear to have existed in the time of Bracton; at least he uses the two words as identical in meaning ('possessio sive seisina multiplex est,' lib. ii., fol. 38).

The seisin of the tenant of a freehold is the legal possession of the land. It is actual seisin, called seisin in deed, when he has corporeal possession of the land, or, as Bracton expresses it, 'corporalis rei detentio: corporis et animi cum iuris adminiculo concurrente.' It is seisin in law when lands have descended to a person, but he has not yet actually entered into possession of them, and no person has usurped the possession. When an estate of inheritance is divided into several estates, as for instance an estate for life, and a remainder or reversion in fee, the tenant in possession has the actual seisin of the lands; but the persons in remainder or reversion have also seisin of their respective estates. The seisin of a rent which issues out of lands is quite distinct from the seisin of the lands; and therefore a disseisin of the estate in the land is not a disseisin of the rent.

The word seisin is also applied to the services due from the tenant to the lord. When the lord has received the tenant's oath of fealty, he has obtained seisin of all his services.

Seisin in deed is obtained by actually entering into lands, and an entry into part in the name of the whole is sufficient; by the receipt of rents or profits; and by the actual entry of a lessee to whom the lands are demised by a person who is entitled to but has not obtained actual possession.

A disseisin supposes a prior seisin in another, and a seisin by the disseisor which terminates such prior seisin. To constitute a disseisin, it was necessary that the disseisor should not have a right of entry; that the disseisee should not voluntarily give up his seisin, and that the disseisor should make himself the tenant of the land; or in other words, should put himself, with respect to the lord, in the same situation as the person disseised. 'But,' it is well remarked (Co. Litt., 266 *b*, Butler's note), 'how this substitution was effected, it is difficult, perhaps impossible, now to discover. From what we know of the feudal law, it does not appear how a disseisin could be effected without the consent or connivance of the lord; yet we find the relationship of lord and tenant remained after the disseisin. Thus after the disseisin the lord might release the rent and services to the disseisee; might avow upon him; and if he died, his heir within age, the lord was entitled to the wardship of the heir.' But the doctrine of disseisin is in many respects very obscure, and at present of little practical importance.

SEISTAN, called also *Segestan*, is a province, or rather a country, situated in the eastern part of the table-land of Iran, and enclosed within the boundaries of the kingdom of Afghanistan. There is some difference between authors who have written on this part of Afghanistan, respecting the extent of country to which this name is to be given. Captain Conolly limits it to the low and flat country which surrounds the Lake of Seistan, and states that its length may be estimated at 100 miles and its breadth at 60; so that it would be equal in extent to Yorkshire. Kinneir and Elphinstone extend it over the whole plain which stretches from the foot of the Mountains of Hazaureh, or the Paropamisus of the antients, southward to the desert and mountains of Beloochistan. Taken in this more comprehensive signification, Seistan comprehends the countries between 30° and 32° 30′ N. lat., and between 61° and 65° E. long., a space the area of which considerably exceeds 36,000 square miles, and is nearly as large as the state of Kentucky.

On the north of Seistan is the extensive mountain-region known to the antients under the name of Paropamisus, and called by modern geographers the Mountains of Hazaureh and Eimack, from the name of two tribes which occupy the most elevated part of it. These mountains, though of great elevation in the centre and along their northern declivity, sink much lower as they approach the Plain of Seistan, and their most southern branches terminate in hills along the caravan road which leads from Girishk on the banks of the Helmund (32° N. lat.) to Furrah on the Furrah-rood (32° 30′). This road constitutes the natural boundary of Seistan on the north. On the east is the Plain of Kandahar, which may be considered as the eastern prolongation of that of Seistan, though it constitutes a different political division, and is excluded from this notice. On the south is the Desert of Beloochistan. [BELOOCHISTAN.] The western boundary is formed by a chain of hills, which Pottinger describes as narrow, though at intervals very lofty; but Conolly says that it is broad and lofty, which seems nearer the truth, as in some places it takes two days to cross it. This chain of rocks appears to extend across the table-land of Iran nearly south and north, from the Surhud in Southern Kohistan to the vicinity of Ghorian west of Herat, and between 60° and 61° E. long. It divides the eastern and smaller plains of Iran from the more extensive deserts which lie west of it. [PERSIA.]

Physical Geography.—The Plain of Seistan, with the adjacent valleys and the Plain of Kandahar and its dependencies, constitutes a closed basin. Not a drop of water which descends on it ever reaches the sea: and this constitutes its peculiar character. The surface sinks from the south and the north, and the lowest part of it is indicated by the course of the river Helmund, from Killah Beest to its entrance into the Lake of Seistan. The southern part of the plain is a desert, large tracts of which are level and without vegetation, the soil consisting of a loose sand which immediately absorbs all moisture. In other places there are numerous sand-hills, the intervals between which are covered either with sand or with gravel. In those parts there are bushes at the base of the mountains, and in some tracts a scanty grass is met with. In a few places the soil is impregnated with salt. No permanent river drains this desert; and the Helmund, which runs along its northern boundary, does not receive any supply from the north, not even during the rains; but wells and tanks are met with at distances not exceeding 24 miles. The country is inhabited by some tribes of Beloochees, who wander about with their herds.

The country on the north of the Helmund does not slope regularly to the south. From the mountains of Hazaureh it descends in terraces, until it reaches the vale of the Helmund and the basin of the Lake of Seistan, which latter is the lowest terrace, in which consequently all the waters that descend into the plain and the surrounding mountains are collected. The whole of this tract approaches to the nature of a desert. The surface is in some parts, especially towards the banks of the Helmund, covered with sand, which however generally forms a firm soil; but it usually consists of a hard earth, mixed with rocks and low hills: the soil, except in the bottoms of the rivers, is of very indifferent quality. Scarcely a tree is found in the whole region, but the plains are covered with low bushes. A few patches occur even at a distance from the rivers, which are cultivated, and, with the exception of some large tracts, these plains supply herbage and water during the great part of the year to the numerous herds of camels and sheep of some tribes of the Dooranees. There are permanent villages among the cultivated lands, but by far the greater part of the inhabitants are scattered over the face of the country in tents. These observations however do not apply to the vales along the rivers, which, according to the vague statements of travellers, seem to be depressed from 200 to 300 feet and more below the general level of the plain. As the mountains of Hazaureh are covered with snow for several months, they give origin to several rivers, which in the season when the snow melts become deep and rapid streams, and run southward either to the Helmund, or fall into the Lake of Seistan. The water of these rivers is used to irrigate the bottoms of the river valleys, and thus a portion of this region is fitted for cultivation, and produces abundant crops.

The Hamoon and the Plain surrounding it, or Proper Seistan.—The Lake of Seistan is called by the natives the Hamoon, a name which designates a plain covered by a sheet of water. It bears also the distinctive name of the Lake of Koh-i-Khwajeh, from a hill which is surrounded by the lake, and which is not far from its eastern banks. The lake extends (between 61° and 62° E. long. and 31° and 32° N. lat.) about 70 miles from south-south-west to north-north-east, and has an average breadth of eighteen miles, except towards its northern extremity, where it widens to more than 30 miles. In these wider parts of the lake there formerly existed a separate lake, called Dúk-i-Teer, which was divided from the Hamoon by an isthmus of moderate width, but about 10 or 12 years ago the Helmund changed its course, and instead of carrying its waters to the great lake, it sent them to the Dúk-i-Teer, and the isthmus was carried away by the waters, so that the two lakes are now only one. The most appropriate appellation of the Hamoon is the classical name of Aria Palus; for it is in reality almost a marsh. It has rarely a depth of more than from three to four feet, and is almost entirely covered with reeds and rushes. The Dúk-i-Teer is a large sheet of water thickly studded with reed-topped islands, its depth averaging about four feet, and having a very muddy bottom. The reeds are tall and close together, but one may walk through them without difficulty. Along its northern banks the water is not so deep, and the reeds are not in patches, but cover the whole surface. In the old Hamoon, on the contrary, the reeds are in most places thick and stiff with age, and stand so close together in clumps, that quadrupeds are unable to force their way through them. Here and there patches of blue water appear between the reeds, but it is only towards the south-west that there is a large sheet of water clear of rushes and reeds. The water of the Hamoon is salt, but not equally so in all parts, the intensity varying according to the depth, the nature of the soil on which it rests, and the proximity to the mouths of the rivers: still it is generally used.

The level country which surrounds the Hamoon may be called the Plain of Seistan Proper. On the west it extends to no great distance from the banks of the lake, and seems to be sterile, a circumstance to be accounted for by the vicinity of the chain of hills which unites the mountains of Beloochistan with those of Hazaureh, and by the fact that only one torrent originating on it falls into the lake. But on the north and east it stretches to the distance of 20 or 30 miles, and to the south-east and south 50 miles and more. It is entirely composed of flats, with the exception of one hill, and in its whole extent not a stone is found, except a few rounded pebbles in the beds of the rivers. The soil is either the light earth of the desert, or the still lighter alluvial deposit of the rivers. There is hardly a tree, and not one of any size in this country. The soil is very fertile wherever it can be watered; but the waters which are brought down by the rivers are not sufficient to irrigate perhaps one-fourth of the plain, and thus probably three-fourths of it are not cultivated. As however, even in those parts which at present are a mere waste, the ruins of large towns are found, it is supposed, that at some remote period and under an enlightened government the waters of the rivers were carried over a much greater extent of country than at present, when the canals and embankments are neglected. This may be truo to some extent. But as the soil is incapable of offering the slightest resistance to the large body of water which is discharged into the plain at certain times of the year with great violence, it is very probablo that the Helmund may have often changed its course. The last change, which occurred only 10 or 12 years ago, makes this supposition very probable. Some hundred years since the river may have discharged the greater part of its waters into the southern extremity of the lake, at which time it fertilised the country round the antient town of Zirreh, from which the lake is frequently called by geographers the Lake of Zirreh. The very extensive ruins of that city are stated to be about 10 miles from the southern extremity of the lake.

Rivers.—All the rivers which originate on the southern and western slope of the mountains that surround the Plain of Seistan on the north and east, fall into the Hamoon. They partake of the nature of mountain torrents, at one time of the year rushing down with great violence, almost black with mud, and at others being either quite dry, or flowing in a clear, languid, and shallow stream. The largest of these rivers are the Helmund, the Khash-rood, the Furrah-rood, and the Adrascund.

The Helmund (the Etymander of the antients) rises nearly in the centre of the mountain-region of Hazaureh, at no great distance from Cabool, to the west of that town. Its general course through the mountain-region is to the south-west, and it leaves it after a course of about 200 miles, some distance above Girishk. In the plain it continues in the same direction to its confluence with the Arghannd-ab river, which enters it just below Killah Beest. From this place it turns gradually more to the west, until it flows due west, but in approaching the meridian of the Dúk-i-Teer, it turns north-north-west, and soon enters the Plain of Seistan Proper. The greater part of its course within this plain is in one channel; but when it is about fifteen miles from the lake it divides into several arms near Khwajeh Ahmed. The greatest volume of water was formerly in the arm which ran westward to the old Hamoon, and divided before it joined the lake into many smaller channels, which circumstance rendered it possible to irrigate a great extent of country. At present, the largest volume of water runs down to the Dúk-i-Teer in a northern direction; and although there is still some water in the antient channels available for irrigation, it is feared that their beds will soon be filled up by the mud which the river brings down in the wet season: in which case the populous and well cultivated country about the towns of Dushtuck, Boorji, Chuling, and Sekoha will be abandoned, and cultivation will be entirely shifted to the southern banks of the Dúk-i-Teer. This river, in the dry season, is never without a plentiful supply of water; during the swell, it comes down with astonishing rapidity, and is, according to the statement of Captain Conolly, equal in size to the Jumna. Its course probably exceeds 400 miles.

The Khash-rood is erroneously laid down in our maps, as it does not join the Helmund, but falls into the Dúk-i-Teer, at no great distance from the new mouth of that river. This river rises in the lower declivity of the mountains of Hazaureh, and flows within their range south-east. It enters the plain near Dilaram, and then runs south-west to its embouchure. Before 1810 it did not enter the Dúk-i-Teer; but on approaching the lake, it spread its waters over a low tract called, from a species of marshy grass (aishk) which abounded there, Aishkineik; but this tract now constitutes a part of the Dúk-i-Teer. The course of the Khash-rood exceeds 100 miles, but in summer it is nearly dry.

The Furrah-rood, which falls into the north-eastern extremity of the old Hamoon, rises likewise in the lower declivities of the mountains of Hazaureh, towards the western extremity of the mountain-region, and its course is mostly to the south-west and south. It passes a little to the north of the fort of Furrah, and runs close under Laush, about 20 miles south of which it enters the lake. Its course exceeds 100 miles. This river is nearly dry for the greater part of the year; water is however confined in many places by bunds or natural hollows, and is always to be found by digging a few feet into the bed, which is the case with most of the rivers of this part of Asia. During the spring it is a broad and rapid river, but not half the size of the Helmund.

The Adrascund falls into the Hamoon, about twelve miles west of the Furrah-rood, and is about the same size. The greater part of the course of this river was unknown a few years ago. It is the same river which waters the Plain of Herat, through which it runs from east to west, rising a considerable distance east of that town. In that part it is called Herat-rood. It afterwards turns to the south-east, and crosses the high-road from Kandahar to Herat, about fifty miles south of the last-mentioned town. After flowing east by south through the Plain of Subzawer, which is enclosed by some low ranges connected with the mountains of Hazaureh, it sweeps round to the west, but gradually turns to the south, in which direction it enters the Hamoon.

Among the smaller rivers the Ibrahim Iooi must be mentioned. It drains a part of the country between the Khash-rood and the Furrah-rood, and probably runs less than fifty miles. It terminates in a marsh seventy or eighty miles north-east of the Dúk-i-Teer, which during the greater part of the year is dry.

The Vale of the Helmund.—As soon as the Helmund has left the hills, and particularly below Girishk, the bottom is generally from four to five miles wide. The bed is converted into a sort of pavement by the stones rolled down from the mountains. The stream now keeps close to the left bank, above which rise, with a steep ascent, the vast mounds which constitute the edge of the desert. The high bank on the right is formed likewise by steep cliffs, which are hollowed and indurated by the action of the water. The space between this bank and the modern channel of the river, of which the average breadth is rather more than two miles, is called Gurmsir (the hot country). It is a rich tract, well cultivated, and full of orchards, in which the mulberry-tree is very plentiful.

The Vales of the Khash-rood and Furrah-rood are of less extent, and we are very imperfectly acquainted with their productive powers. Captain Conolly in his map has inserted the names of a considerable number of places in the vale of the Khash-rood, between the lake and the town of Khash, and on that of the Furrah-rood as far as Furrah, and even at some distance farther north, from which we must conclude that the vales of these two rivers, in the lower part of their course, possess a considerable degree of fertility, and are tolerably populous. We cannot suppose that these places are small, as the country on both sides of the rivers is traversed by the wild hordes of the Beloochees, against which the inhabitants must be able to defend themselves.

The Vale of the Adrascund seems to be less favourable to cultivation. Where the river leaves the mountain-region it runs in a narrow valley called Jaya, then passes through Anardureh, or the Valley of Pomegranates, after which it enters a tract, which from its extreme barrenness is called Tug-i-Noomed, or the Waste of Despair. Towards its mouth the valley grows wider, and admits of cultivation to some extent.

Climate.—Our information respecting the climate of Seistan is very scanty. The heat in summer is more oppressive than at Kandahar. For nearly half the year a strong steady wind blows from the snowy mountains which lie to the north. This wind, which is called the Bad-i-sud-o-bist-roz, or the wind of 120 days, is confined to a breadth of about 80 miles, between the range of hills west of the Hamoon and the town of Khash, and this circumstance is explained by considering the extent of the desert plain of of Beloochistan, which between 61° and 64° E. long. reaches far to the south between the two projecting mountain masses of the mountains of Beloochistan. During the prevalence of this wind the days are very hot, but the nights are generally cold. It affects the eyes of the inhabitants, particularly by the dust which it raises, and which is mixed with particles of salt. During the three months of the winter the weather is very pleasant, and similar to that in the north-west part of Hindustan. Snow has been known to fall in Seistan, but it is a rare and remarkable occurrence. The climate however is generally unfavourable to human life, which is mainly to be attributed to the immense quantity of stagnant water, especially in the vicinity of the Hamoon.

Productions.—Wheat is raised to a great amount; rice is not so extensively cultivated, except in some parts of the Gurmsir. Some coarser grains, as bajra, are grown in many parts. Cotton is an important article of cultivation: the plant is not half the height of the Indian one, but it bears a large pod. Tobacco is raised to a small extent, and is of bad quality. The water-melons are singularly large. They are raised in enormous quantities on the margin of the Hamoon. There are neither artificial grasses, vegetables, nor flowers. The largest tree in the Plain of Seistan Proper is a prickly pomegranate. The shores of the lake are lined with tamarisks, which however are only bushes, and rarely attain a large size. The Gurmsir is well stocked with mulberry-trees.

There is hardly a horse in the country. The mortality which prevails among them is generally attributed to the irritation produced by the flies, with which the country swarms at certain seasons. Of more than 5000 horses brought some years ago to Seistan in a military expedition, not one is said to have been alive six months afterwards. The few horses which are kept for state are tended with the greatest care in dark stables, from which they only come out on important occasions, except during the winter. Camels are numerous in the Gurmsir, and in the desert south-east of Seistan Proper, but are not numerous in the last-mentioned country. Sheep and goats constitute the principal wealth of the pastoral tribes which inhabit the deserts. The sheep are remarkable for their tails, which are a foot broad, and entirely composed of fat. Mules and asses are numerous, and thrive well. The cattle are of good size, and much valued in the neighbouring countries. People send their cows from a distance to pasture on the reeds of the Hamoon, which soon bring them into condition, but a cow thus fattened does not yield the same quantity of milk as the Kandahar cow, which feeds on the artificial grasses. Three or four hundred Seistan cows are exported annually to Kandahar, Persia, and other neighbouring countries. The more common wild animals are wolves, which will attack cows and even men, jackals, hyenas, porcupines, hedgehogs, kangaroo-rats, and others. The skins of the otters are exported to Bokhara, where they fetch a high price. The marshy and rocky parts of the Hamoon shelter innumerable wild hogs, which are very destructive to the fields. They are hunted with dogs, which are large, strong, bold animals, resembling the Bhil dog of Hindustan, and are regularly trained to hunt. When the waters are rising in the spring, herds of thirty and forty wild hogs are to be seen swimming one behind the other from island to island. Wild asses and deer abound in the desert which lies between the Hamoon and the hills west of his natural love of ease and retirement, which Clarendon speaks of, would make him less likely to proceed to violent measures, obtained for him, through the interest of Laud, his entire liberation. Soon after he appears to have approached the court party, and to have gained even the personal favour of Charles, to whom he dedicated the well-known treatise, 'Mare Clausum.'

In the great case of ship-money we find no mention of Selden; and as his knowledge and learning would have made him a valuable counsel in Hampden's behalf, it is probable that he either declined to defend, or that Hampden's party thought it not prudent to request his aid on account of his recent approaches to the court party. From this time his behaviour may be thought somewhat inconsistent, unless we consider his conduct in the Long Parliament, which assembled in 1640, and to which he was unanimously returned a member by the University of Oxford, rather as that of a retained advocate. He sat on the committees of the lower house, which undertook the proceedings against Strafford, though he was not one of the managers before the House of Lords, and his name also was enrolled as 'one of the enemies of justice,' a title given to those who favoured the earl. Though the friend of Laud, by whom he was desired to write many of his works, he was nominated by the House to frame the articles of impeachment against the archbishop. He made no opposition to the resolutions which ultimately caused the exclusion of the bishops from the house of peers. Afterwards we find him agreeing to a protestation that the House of Commons should maintain the Protestant religion according to the doctrines of the English church, and defend the authority, privileges, and person of the king. He also appears to have offered no opposition to the illegal proceedings of this parliament in the affair of Sir John Hotham; but as he did not expressly favour them, the court continued to regard him as their friend, until the quarrel of the king with his Commons arose about the militia, when Selden spoke against the commission of array which Charles had been driven to resort to on being deprived of all authority over his own army. Lord Falkland, by the king's desire, wrote a friendly letter to Selden, asking his reasons for the strong opinion which he gave in this question. In his answer Selden still urged the illegality of the commission, but at the same time he inveighed against the ordinance for the militia, which the parliament had declared as being 'without any shadow of law or pretence of precedent, and most destructive to the government of the kingdom.' He further declared his intention of speaking against this ordinance, and he did his utmost to obtain the rescinding of it, though without success.

Charles about this time becoming displeased with the wavering conduct of the Lord Keeper Littleton, inclined to take from him the great seal, and give it either to Banks or to Selden. He did not doubt the affection of the latter to his person, yet knowing that he was in years, and preferred ease to any preferment, and private studies to public business, he abandoned the idea; indeed throughout his whole life Selden was devoted to retirement and to literary pursuits, and it is not easy to decide to which party he most inclined; it is probable that he was respected by the king, who knew his honesty. His last public acts of any importance were the discussions in which he took part in the Assembly of Divines at Westminster, to which he was appointed one of the lay members, and where he is said to have perplexed his ecclesiastical antagonists by the depth of his learning and the variety of his knowledge. In 1643 he took the Covenant, and in the same year the parliament made him chief keeper of the rolls and records in the Tower. In 1645 he was one of the twelve commoners appointed to be commissioners of the Admiralty; and he was chosen to succeed Dr. Eden as master of Trinity Hall, Cambridge, an honour which he declined. In the following year the parliament, sensible of his services, voted him the sum of 5000*l*. 'Though some there are that say that he refused and could not out of conscience take it, and add that his mind was as great as his learning, full of generosity and harbouring nothing that seemed base' (Wood's *Athenæ*); and though these latter acts are proof of his adherence to the popular party, yet he continued to be much esteemed by many of the royalists, and Charles, even if he had the will, was by this time deprived of the power to retaliate. Selden had great influence in the House of Commons, and he frequently used it for the best purposes. He procured the restitution of the endowment of the Arabic professorship in Oxford, which had been seized on the attainder of Laud, by whom it was founded; and he succeeded in preserving the library of Archbishop Usher from dispersion. He remained in parliament after the execution of the king, though it does not appear what his conduct or opinions were in that transaction. He withdrew from public affairs as much as possible, and declined to write an answer to the 'Eikon Basilike,' at the request of Cromwell. Selden died November 30, 1654, at the Carmelite or White Friars, the house of Elizabeth, countess dowager of Kent, whose estates he had latterly managed. He had lived with the countess for some time, and it was reported that he had been married to her. He was buried in the Temple Church, where a monument was erected to him. He bequeathed his very valuable collection of books to his executors, of whom one was Sir Matthew Hale, to be placed in some convenient library or college. His original intention was to give it to the University of Oxford, but having taken offence at the authorities of the Bodleian for requesting a bond of restitution from him on an occasion of his desiring to borrow one of their MSS., he struck the bequest from his will. Hale and his co-executors however, considering themselves executors 'of his will, and not of his passion,' sent the books, about 8000 volumes, to Oxford, where a noble room was allotted for their reception. It is said the executors first offered them to the society of the Inner Temple, but the society, neglecting to provide a proper place for them, lost the valuable gift.

Selden was a diligent student, and his literary labours only ended with his life. In the treatise entitled 'Mare Clausum,' published in 1635, he maintains the *right* of England to exclude the fishermen of Holland from the seas, which she asserted to be her own, in answer to the treatise of Grotius, entitled 'Mare Liberum,' which denied the right. The controversy arose from a dispute between the British and the Dutch concerning the herring fishery on the British coast. Selden maintained that a dominion over any part of the sea may be acquired. This work greatly raised his reputation at court, where his arguments were considered conclusive. In 1640 appeared his great work, 'De Jure Naturali et Gentium, juxta Disciplinam Ebræorum.' 'The object of the author,' says Hallam, 'was to trace the opinions of the Jews on the law of nature and nations, or of moral obligation, as distinct from the Mosaic law; the former being a law to which they held all mankind to be bound. This theme had been of course untouched by the Greek and Roman philosophers, nor was much to be found upon it in modern writers. His purpose is therefore rather historical than argumentative; but he seems so generally to adopt the Jewish theory of natural law, that we may consider him the disciple of the Rabbis as much as their historian.' (Hallam's 'Literature of Europe,' vol. iii., p. 334.) He published also 'A Brief Discourse concerning the Power of Peers and Commons;' 'Privileges of the Baronage of England;' an edition of the 'Origines' of Eutychius; 'De Anno Civili et Calendario Judaico,' &c.

As a learned lawyer Selden holds a high rank. His 'Dissertation on Fleta,' which, like most of his other works, is written in Latin, shows him to have been thoroughly acquainted with the origin of our own law, and its gradual development under the influence of the civil law. Some few errors have been detected in this valuable essay, but it is an evidence of learning and research of which there have been few similar instances among English lawyers since his time. To say that Selden wrote Latin with ease and sufficient correctness and elegance is no great praise, considering the age in which he lived. Whitelocke, his biographer, Wilkins, Baxter, and Clarendon, all bear testimony to the excellence of his character and his learning. Clarendon, who was his intimate friend, says, 'Mr. Selden was a person whom no character can flatter or transmit in any expressions equal to his merit and virtue.'

Wood says of him: 'After he had continued there (the Temple) a sedulous student for some time, he did by the help of a strong body and a vast memory not only run through the whole body of the law, but became a prodigy in most parts of learning, especially in those which were not common or little frequented or regarded by the generality of students of his time. So that in few years his name was wonderfully advanced not only at home but in foreign countries, and was usually styled the great Dictator of learning of the English nation. . . He was a great philologist, antiquary, herald, linguist, statesman, and what not.' (Wood's *Athenæ*.)

There was an apparent indecision and variableness in Selden's public conduct, which makes it difficult to determine what his political principles really were. The most favourable and perhaps the most correct judgment is, that he was sincerely opposed to the arbitrary measures of the crown, and equally unwilling to go all lengths with the parliaments.

Selden was very intimate with Ben Jonson, who addressed a poetical epistle to him, in which he styles his friend 'monarch in letters.' Selden's name has been made familiar to many persons by a small volume, entitled 'Table-Talk.' 'This valuable little collection of acute and learned remarks was first published in 1689, thirty-five years after Selden's death, in a quarto pamphlet of sixty pages, with the title of "Table-Talk; being the Discourses of John Selden, Esq., or his sense of various matters of weight and high consequence, relating especially to Religion and State." In the dedication, his amanuensis, Richard Milward, by whom it had been compiled, states that he had had the opportunity of hearing Selden's discourse for twenty years together, and that of what is here collected "the sense and notion is wholly his, and most of the words." Milward seems to have been a person of judgment, for there is very little in what he has preserved that has not a real value.' ('Library of Anecdote—Book of Table-Talk,' vol. i.) It must be admitted that Selden's 'Table-Talk' contains many just remarks on matters moral and political, expressed in a forcible manner; but though they are not wanting in originality, they can hardly be said to be marked by depth, and many of them are rather characteristic of a man of the world than of a retired student. It seems probable, from the circumstance of the publication, that some part of the collection is not genuine.

SELECT VESTRY. [VESTRY.]

SELEFKEH. [SELEUCEIA.]

SELE'NE (Σελήνη), the Moon, was worshipped as a goddess by the antient Greeks. She is generally represented as the sister of Helios, or the Sun; sometimes as his daughter, and occasionally as his wife, and the mother of the four Seasons. She was believed to drive her chariot through the heaven during the night. (Hom., *Hymn.*, xxxii. 7.) Her chariot is usually represented in antient works of art drawn by two horses, whereas that of Apollo was drawn by four. (*Dictionary of Greek and Roman Antiquities*, p. 310, London, 1840.)

In course of time the attributes of Selene were given to Artemis, and the latter was represented as the goddess of the moon; but these deities were originally distinct. Among the Romans Diana appears to have been originally the goddess of the moon, the word *Diana* containing the same root as *dies*, and meaning originally the goddess of light. When it became the fashion to identify Artemis and Diana, the attributes of each were given to the other; and thus Artemis was represented as the moon, and Diana as the goddess of hunting. [ARTEMIS; DIANA.]

SELENITE. [CALCIUM.]

SELE'NIUM, a nonmetallic, solid, elementary body, discovered in 1818 by Berzelius in the iron pyrites of Fahlun: the sulphur procured from this was used at Gripsholm in the manufacture of sulphuric acid, and in it a deposit was formed of a red colour, which, on account of the peculiar odour that it emitted, was supposed, though erroneously, to contain tellurium, the origin of which name for this metal suggested that of *selenium*, from Σελήνη, the moon, for the new substance. The discoverer considers it as a metal, but it is not generally classed with the metals.

This substance has been found hitherto only in small quantity; it occurs in the pyrites of Anglesey, and probably in that of many other places: sulphuret of selenium has been detected among the volcanic products of the Lipari Isles; and in the Harz it has been met with, combined with lead, silver, and some other metals.

Magnus proposes to extract selenium from the native sulphuret by treating it with binoxide of manganese, by the oxygen of which the sulphur is converted into sulphurous acid; this escapes in the gaseous form, while the selenium either sublimes in its pure state or as selenious acid.

The properties of selenium are, that it is solid, has a metallic lustre, and the appearance of lead when in mass; but when reduced to powder, it has a deep brown colour. It is inodorous and insipid, moderately hard, may be readily scratched with a knife, is brittle as glass, and easily reduced to powder. Its fracture is conchoidal, and perfectly metallic. Its specific gravity varies from 4·30 to 4·32, on account of the cavities which it frequently contains. It is a bad conductor of heat, and a nonconductor of electricity. It softens at 212°, and may be drawn out into fine threads, which are transparent, and of a red colour by transmitted light. When heated rather higher, it become fluid, and boils at 650°, emitting a vapour, which is inodorous, and of a deep yellow colour; this in close vessels condenses in dark globules of a metallic lustre, or of a cinnabar-red colour, according as the space in which it collects is small or large. Water does not dissolve selenium; it is however soluble in the fat oils and melted wax, but not in the volatile oils.

Oxygen and Selenium combine in three different proportions, forming oxide of selenium, selenious acid, and selenic acid.

Oxide of Selenium may be formed by heating the selenium in a limited quantity of atmospheric air, and by washing the product to separate the selenious acid formed with it. Its properties are, that it emits a very strong smell resembling that of decayed horse-radish, so that 1-50th of a grain is sufficient when burnt to scent a room of considerable size, and this is a characteristic property of selenium. Oxide of selenium is gaseous, colourless, very slightly soluble in water, and quite devoid of acid properties.

It consists of—

One equivalent of oxygen . .	8
One equivalent of selenium .	40
	—
Equivalent . .	48

Selenious Acid may be prepared by passing a current of oxygen gas over heated selenium; but it is more conveniently obtained by digesting selenium in nitric acid or nitro-hydrochloric acid till dissolved, and then evaporating the solution to dryness.

The properties of this acid are, that it is colourless, and when strongly heated sublimes, and condenses unchanged in the form of acicular crystals, which possess distinctly-marked acid properties. It attracts moisture from the air, and is consequently very soluble in water; a hot saturated solution yields crystals on cooling; it is also soluble in alcohol, and has when heated an acrid odour. It forms salts with bases, which are called *Selenites*.

Many substances which have strong affinity for oxygen decompose selenious acid; this is the case with sulphurous acid and phosphorous acid, and when the former is added to a solution of selenious acid, a red powder is precipitated, which is pure selenium, and sulphuric acid is at the same time formed. An alkaline sulphate produces a similar effect; hydrosulphuric acid is also decomposed by and decomposes selenious acid, and a yellow compound is formed and precipitated, which is sulphuret of selenium.

Selenious acid is constituted of—

Two equivalents of oxygen . .	16
One equivalent of selenium .	40
	—
Equivalent . .	56

Selenic Acid may be prepared by fusing selenium, a seleniuret, or selenite, with nitrate of soda. The seleniate of soda obtained, when it has been purified, is to be decomposed by nitrate of lead, and the insoluble seleniate of lead precipitated is to be decomposed by a current of hydrosulphuric acid, which throws down the lead as a sulphuret, and the selenic acid remains in solution, with some excess of hydrosulphuric acid, which is to be expelled by ebullition.

Selenic acid is liquid, colourless, inodorous, of an oleaginous consistence, and very caustic; it attracts moisture from the air, and always retains about 12·4 per cent. of water, which cannot be expelled without decomposing the acid. It may be heated to 536° without decomposition, but at 554° it is rapidly converted into oxygen and selenious acid. When concentrated at a temperature of 329°, its specific gravity is 2·524, and it gradually increases up to the temperature of 545°, when it becomes 2·625. When mixed with water, much heat is evolved. Its salts are called *Seleniates*. Zinc and iron are dissolved by this acid with the evolution of hydrogen gas, and copper with the formation of selenious acid.

It is composed of—

Three equivalents of oxygen .	24
One equivalent of selenium .	40
	—
Equivalent . .	64

Azote and Selenium.—No compound of these is known.

Hydrogen and Selenium unite to form hydroselenic acid or seleniuretted hydrogen. It is easily obtained by the action of diluted sulphuric acid upon seleniuret of potassium, or of iron and some other metals. This gas is colourless, has a disagreeable odour, and so powerfully irritates the membrane lining the nose as to excite symptoms of catarrh and destroy the sense of smelling for some hours. Water readily dissolves this gas: the solution is at first colourless, but after a time it acquires a reddish hue; it gives a brown stain to the skin, and reddens litmus paper, as other acids do. When exposed to the atmosphere it is decomposed, its hydrogen being absorbed by oxygen, and the selenium is deposited. It decomposes the solutions of many metallic salts, seleniurets of the metals being precipitated.

It consists of—

One equivalent of hydrogen .	1
One equivalent of selenium .	40
Equivalent . .	41

Chlorine and Selenium combine when the gas is passed over the selenium; heat is evolved, and a brown chloride is obtained, which is liquid; it is heavier than water, not very volatile, and by the action of water is eventually decomposed, and resolved into selenious and hydrochloric acids.

It is composed of—

Two equivalents of chlorine .	72
One equivalent of selenium .	40
Equivalent . .	112

This bichloride may be converted into a terchloride by exposure to excess of chlorine. It is a white solid compound which is volatilized when heated, and condenses in small crystals. It is decomposed by water.

Sulphur and Selenium.—A definite compound of these is formed by passing hydrosulphuric acid gas into a solution of selenious acid; the fluid assumes a yellow colour, becomes turbid, and a precipitate is formed, though but slowly, unless a little hydrochloric acid be added. When exposed to heat the sulphuret of selenium becomes red and viscid, and at high temperatures may be distilled without decomposing.

It is a bisulphuret, composed of—

One equivalent of sulphur .	16
One equivalent of selenium .	40
Equivalent . .	56

Phosphorus and Selenium combine when the selenium is dropped in melted phosphorus; it is a red substance, but it does not appear that any definite compound of these bodies has yet been analyzed.

Selenium forms seleniurets with most of the metals, and the seleniuret of lead is one of the most abundant of the native compounds which occurs in the Harz. [LEAD.]

The characteristic properties of selenium are those of tinging the flame of the blowpipe of a light blue colour, and emitting an acrid vapour, when heated in the air, which has the peculiar smell of decayed horse-raddish.

SELEUCI'A. [SELEUCEIA.]

SELEUCEIA (Σελεύκεια), a town of Assyria, on the western bank of the Tigris, and a few miles to the south of the modern Bagdad, was built by Seleucus Nicator, in the form of an eagle with extended wings. (Plin., vi. 30.) It became, at the expense of Babylon, the most important city in the East, but declined in population after the foundation of Ctesiphon by the Parthians, on the eastern bank of the Tigris. It contained, in the time of Pliny, 600,000 inhabitants. A republican institution was given to it by Seleucus, which it retained under the Parthians. (Tacit., *Ann.*, vi. 42.) It was burnt by the Romans in the expedition of Trajan into the East. (Dion Cass., lxviii. 30), and again by Lucius Verus, the colleague of Aurelius, at which time it contained 500,000 inhabitants. (Dion Cass., lxxi. 2; Eutrop., viii. 5.) It was also taken by Severus (Dion Cass., lxxv. 9), from which time it seems to have been almost abandoned by its inhabitants. Julian found it completely deserted. (Amm. Marcell., xxiv. 5.)

Rich, who visited the ruins of Seleuceia in 1812, says that they are directly opposite those of Ctesiphon, and not to the north of the latter, as is generally stated. According to his account there is an enclosure, of which one side is formed by the river, but the others are walled round. A great part of the western wall is destroyed; but the northern and the southern walls still remain. In the area are some heaps of ruins; but the greatest quantity are outside the limits of the enclosure to the westward, where they extended to a very great distance. (*Residence in Koordistan*, &c., vol. ii., p. 405.)

There were several other cities called Seleuceia, one of which was about five miles north of the mouth of the river Orontes in Syria. The remains of this Seleuceia are at a place now called Souadich.

SELEU'CIDÆ, a Greek dynasty in Asia, founded, after the death of Alexander the Great, by Seleucus, the son of Antiochus. His father was one of the generals of Philip, and he himself accompanied Alexander in his Asiatic campaigns, in which he so distinguished himself as to be ranked among his greatest generals. On the division of the empire at the death of that prince, Seleucus was entrusted with the important command of the body of cavalry called the Companions, which had been before held by Hephæstion and Perdiccas; and he was also, according to Justin, made commander of the camp. The satrapy of Babylon was bestowed upon him in the new partition, after the death of Perdiccas (321 B.C.). In the war which followed, he took the part of Antigonus against Eumenes. After the death of the latter (315 B.C.), he received Antigonus into his territory with great appearance of friendship; but taking offence at the tone of superiority which his guest assumed, and dreading his power, he fled to Egypt, and joined Ptolemy Soter, Lysimachus, and Cassander in a league against him.

The defeat of Demetrius at the battle of Gaza enabled Seleucus to recover Babylon with a very small force. From this period, 312 B.C., commences the æra of the Seleucidæ. Shortly afterwards he obtained possession of Media, in consequence of his victory over Nicanor, the satrap appointed by Antigonus over this province, whom he is said to have killed with his own hand. After the sea-fight, 306 B.C., in which Demetrius defeated Ptolemy, Seleucus, following the example of the three other great monarchs, assumed the diadem and the title of king. Extending his dominions partly by force and partly by conciliation, he conquered Bactria, and probably most of the provinces enumerated by Appian (*Syriaca*, 55), which Diodorus calls the Upper Satrapies; and is said, in consequence of these victories, to have assumed the title of Nicator. Making an expedition against Sandrocottus, an Indian king, he was induced to form an alliance with him, strengthened by which he returned with a large army to the war with Antigonus, which was finally concluded by the battle of Ipsus, 301 B.C. In the division of territory which followed, Seleucus obtained for his share Syria and the inland part of Phrygia, and he made further accessions till he acquired Cappadocia, Seleucis, and, according to Appian (*Syriaca*), all the provinces conquered by Alexander between Phrygia and the Indus. Having now leisure to promote civilization, he planted many cities, the most celebrated of which were Antioch in Syria and Seleuceia near Babylon: in peopling these he gave great privileges to the Jews. In consequence of the close alliance between Ptolemy and Lysimachus, Seleucus took in marriage Stratonice, the daughter of Demetrius Poliorcetes but wishing him to give up Cilicia and Sidon, and finding him unwilling to accede to his demands, he soon engaged in a war with him, which was terminated in the defeat of Demetrius, who was taken prisoner, 286 B.C., and died after three years' captivity. Before this marriage, Seleucus, by a former wife, Apama, the daughter of Artabazus, had had a son Antiochus, who conceived a strong passion for his mother-in-law Stratonice, to gratify which Seleucus resigned her, making over to him at the same time the majority of the seventy-two satrapies comprised in his great empire, and reserving for himself those only to the west of the Euphrates. At the close of his reign, he made war upon Lysimachus, and, upon his defeat and death, conceived the design of conquering Macedonia. Passing over to Europe for this purpose, he was treacherously killed by Ptolemy Ceraunus, whom he had received with great kindness on his flight from Egypt. This was B.C. 280, in his eighty-second year. The character of Seleucus is much praised by antient historians. His military talents are generally admitted, and he was not deficient in the virtues of civilization. A liberal spirit is shown in his treatment of Demetrius after he fell into his hands, and in other anecdotes recorded of him. The prudence of the later measures of his reign, the division of his empire and his expedition into Macedonia, may be doubted. He was possessed of great personal strength and courage.

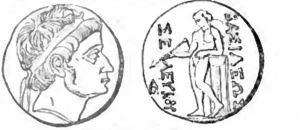
The following list contains the successors of Seleucus, with the dates of their accessions, and a short notice of those who bore his name:—

2. Antiochus Soter.
3. Antiochus Theus, B.C. 261.
4. Seleucus Callinicus succeeded his father Antiochus Theus, B.C. 246. The empire was at this time much weakened by the defection of Bactria and Parthia, and the wars of the Antiochi with Ptolemy Philadelphus. Immediately on the accession of Seleucus, his mother, jealous of any rival candidates for the throne, contrived the death of Berenice, the Egyptian wife of the late king, and of her son. To avenge his sister's death, Ptolemy Euergetes invaded the dominions of Seleucus, and passing the Euphrates, overran them as far as Bactria. Seleucus, being hard pressed in this war, called in the aid of his brother Antiochus Hierax, promising him all the provinces of his empire in the lesser Asia. Strengthened by an alliance with some of the cities in Asia Minor (his treaty with Smyrna is still preserved among the Arundelian Marbles), he attempted to conclude a peace with Ptolemy, but which was broken off by his ambitious brother Hierax, who, supported by the king of Egypt and some of the Gaulish mercenaries, maintained himself for a long time against Seleucus; and being at length defeated, fled to Ptolemy, and perished in Egypt.
5. In the latter part of his reign, Seleucus seems to have made two expeditions against Parthia, in the latter of which he was taken prisoner by Arsaces, and it does not appear that he was ever released from his captivity. He died of a fall from his horse, and was succeeded by his son Seleucus Ceraunus, B.C. 226, a weak prince, who was cut off by a conspiracy in his own army while on his march to attack Attalus, king of Pergamus, who had seized the greater part of Asia Minor, B.C. 223.
6. Antiochus Magnus, brother to the late king.
7. Seleucus Philopator, B.C. 187, son of Antiochus, succeeded to an impoverished kingdom, and reigning feebly for twelve years, was murdered by Heliodorus.
8. Antiochus Epiphanes, his brother, B.C. 175.
9. Antiochus Eupator, 164.
10. Demetrius Soter, 162.
11. Alexander Bala, a usurper, 150.
12. Demetrius Nicator, 146.
13. Antiochus Sidetes, 137 to 128.
14. Seleucus, son of Demetrius Nicator, put to death by his own mother immediately on his accession.
15. Antiochus Grypus, B.C. 125.
16. Antiochus Cyzicenus, B.C. 112 to 95; after the first eighteen months of his reign, jointly with Grypus, till the death of the latter, B.C. 96.
17. Seleucus VI., and last of the name, surnamed Epiphanes Nicator, the son of Antiochus Grypus, driven by Antiochus Eusebes into Cilicia, was there besieged in Mopsuestia, and killed, B.C. 95.
18. Antiochus Eusebes.
19. Philippus.
20. Antiochus.
21. Tigranes, king of Armenia till B.C. 69.
22. Antiochus Asiaticus, expelled by Pompey, B.C. 65; end of the dynasty of the Seleucidæ.

With few exceptions, the kings of this race were weak and depraved, enfeebled by the vices of their age and country, or not less by the decaying state of their empire. The decline of this monarchy, commencing from the latter years of the reign of its first founder, was accelerated by the maritime and commercial superiority of Egypt owing to the possession of Cyprus, Cilicia, and Tyre, by the formation of the independent kingdoms of Bactria and Parthia, and the growth of the power of the kings of Pergamus. After the defeat of Antiochus Magnus by the Romans, the Seleucidæ could only maintain a hopeless struggle with hostile neighbours and disaffected subjects. How far the destinies of the Eastern world might have been changed, had Seleucus made the Euphrates the boundary of his empire, and abandoned his western conquests, is a question not undeserving consideration.

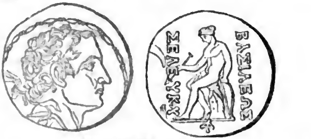
The coins of this dynasty are very numerous. Those of Seleucus Nicator are distinguished from the rest by their exact resemblance in type, style, and weight to those of Alexander the Great. The young head of Hercules in the lion's skin, Jupiter Ætophorus seated, the head of Pallas on the obverse, and of Victory holding out a wreath on the reverse, are copied, with the name of Seleucus instead of Alexander: there are others with a horned head of Seleucus, said to refer to his extraordinary effort of strength in holding a bull by the horns; and we are told by Appian (*Syriaca*), that his statues, in consequence, were represented horned. We also find the anchor as a type, which probably refers to a prodigy at his birth, recorded by the same author, and prophetic of his future destiny.

On the coins of the later Seleucidæ we have as a very general type Apollo, either standing or seated on the cortina, holding in one hand an arrow, in the other a bow strung. Other types are winged heads, probably relating to Perseus, the great ancestor of the Macedonians; the elephant and the prow of a vessel, in reference to the naval and military forces of the empire. All the kings bearing the name of Seleucus struck coins, with the exception of the fifth; and we may remark the long and pompous title of the last of these monarchs, ΣΕΛΕΥΚΟΥ ΕΠΙΦΑΝΟΥΣ ΝΙΚΑΤΟΡΟΣ, as contrasted with the falling fortunes of the dynasty, and with the simple inscription on the coins of the founder, ΒΑΣΙΛΕΩΣ ΣΕΛΕΥΚΟΥ. The scattered history of the Seleucidæ has been collected from Justin, Appian, Diodorus, Polybius, and others, by the authors of the 'Universal History;' Vaillant, 'Historia Seleucidarum;' Fröhlich, 'Annales Regum Syriæ;' Clinton, 'Fasti Hellenici,' iii.; and Droysen, *Geschichte der Nachfolger Alexanders*.



British Museum. Silver.

Head of Seleucus II., with the diadem. Apollo standing leaning on a tripod; in his right hand an arrow; the inscription ΒΑΣΙΛΕΩΣ ΣΕΛΕΥΚΟΥ, and monogram.



British Museum. Silver.

Head of Seleucus IV., with the diadem, and the inscription ΒΑΣΙΛΕΩΣ ΣΕΛΕΥΚΟΥ: Apollo seated naked on the cortina, in his right hand an arrow, in the left a bow strung; below, the monogram.

SELEUCUS. [SELEUCIDÆ.]

SELGE. [PISIDIA.]

SELIM I., emperor of the Turks, was the son of Bayezid or Bayacet II. He was born under the reign of his grandfather Mohammed II., in 1467. Being governor of Trebizonde in 1511, he revolted against his father, and marched to Constantinople. Though he was defeated, and obliged to seek his safety in flight, the janissaries and the spáhis being in his favour, his father Bajazet was compelled to resign the throne to him, and he was accordingly proclaimed on the 23rd of May, 1512. Selim was then about forty-six years of age. His first step after his accession was to march against his eldest brother Ahmed, who was at the head of some troops in Asia. He defeated and put him to death, as well as another brother named Korkúd, and several of his nephews. Selim next invaded the dominions of Shah Ismaïl, king of Persia, who had espoused the cause of his brother Ahmed; he defeated him in a pitched battle, and took Tabriz, the capital of Persia (Sept. 1514). After annexing Diyar-bekr to his empire, and recovering Bosnia, which had been occupied by the Hungarians, Selim, in 1517, turned his arms against Kansú-al-Ghauri, sultan of Egypt, whom he defeated and slew at Merj-Dabik, close to Aleppo (Aug. 24, 1516). Taking the route of Hamah, Hemts (the antient Emesa), and Damascus, which cities made no resistance, and submitted to him, Selim marched his army into Egypt. Close to Cairo he was opposed by Tumán Bey, whom the Mamlúks had chosen for commander after the death of Kansú; but in the battle that ensued that prince was defeated and slain, and the dynasty to which he belonged completely overthrown. Master of Syria and Egypt, Selim returned to Constantinople, where he made a vow not to lay down his arms until he had subdued the whole of Persia. Death however prevented the execution of his project. As he was journeying from Constantinople to Adrianople, he was attacked by a disease which terminated in his death at Ogrash-Koi, a village of Thrace, on the 22nd of September 1620. Selim was one of the most able and vigorous of the Othoman sovereigns. He made greater additions than any of his predecessors to the Turkish empire. His eminent qualities were however stained by his excessive cruelty, of which he gave remarkable instances during his reign. He was succeeded by his son Suleyman, surnamed 'the Great.'

SELIM II., emperor of the Turks, succeeded his father Suleyman in 1566. The principal events of his reign were the suppression of a formidable rebellion in Yemen (1568-70), the taking of Tunis and La Goleta from the Spaniards, and the conquest of Cyprus, which after a vigorous resistance was taken from the Venetians in 1571. In the same year was fought the celebrated naval battle of Lepanto, by which the Turkish navy was almost annihilated. [LEPANTO.]

Notwithstanding this splendid success, the Venetians, in 1574, were obliged to make peace with the Turks upon very disadvantageous terms. During the remainder of Selim's reign, the affairs of the Othoman empire were very prosperous. Selim died on Sept. 12, 1574, and was succeeded by his eldest son Murád.

SELINUNTINE MARBLES. [SCULPTURE.]

SELJUKIDES, or SELJUCIANS, a dynasty originally Tartar, and descended from a captain named Seljuk; they settled first in Transoxiana, whence they made their way into Khorassan; and afterwards, under the name of the Iranian, Kermanian, and Rumi dynasties, governed great part of the south of Asia.

The oriental account of the origin of this family, as far as can be gathered from somewhat conflicting statements, is as follows:—Seljuk was the son of Dekak, one of the bravest and most trusted officers of Bigú, chief or khan of the Kipchak Tartars, who inhabited the plain north of the Caspian. This prince, expecting from Seljuk the valour and fidelity of his father, brought him up from his boyhood, and found all his expectations fulfilled in him; but the growing influence of the favourite, and some insolence towards his master, provoked the latter to banish him from his territories; and Seljuk in consequence settled in the neighbourhood of Samarkhand and Bokhara, where he laid the foundation of a small state. He also embraced Mohammedanism, and is said to have been killed, at the age of 107, in a skirmish with the pagan Tartars on the frontiers of the Mohammedan empire. Seljuk left three, or, according to others, four sons; but the most influential members of his family were his two grandsons, Mohammed or Togrul Beg, and Daoud or Giafar Beg, who sent their uncle Israel to make terms of alliance with Mahmoud of Ghizni, the then ruler of Khorassan. Mahmoud is said to have questioned Israel on the resources of his family; and to have received for answer, in the quaint style of the East, that if Israel were to send to his camp one of two arrows which he carried in his hand, fifty thousand horsemen would be despatched to his orders; on sending the other arrow, fifty thousand more; and that if he despatched the bow, it would be answered by sending to him two hundred thousand horsemen: information which so startled Mahmoud, that he confined the ambassador till his death in one of the castles of Khorassan. Oriental historians differ as to the passage of the Seljuk family into Khorassan, some of them placing this event under the reign of Mahmoud, and others under that of his son Massoud. It appears certain however that Abu Taleb Mohammed Rocneddin (the pillar of the true religion), named also Togrul Beg, or, as the Greeks have corrupted it, Tangralopex, was crowned at Nishapour, A.H. 429 (A.D. 1038), being the first of the Iranian dynasty of the Seljukides. The conquest of Nishapour was followed by that of Herat and Meru, and shortly after of nearly the whole of Khorassan. The whole of his reign of twenty-six years was occupied in wars with the sultans of the Gaznevide dynasty, and in successive conquests of the provinces of Persia; and on his death, and that of his brother Jafar Beg, the whole conquests of the two devolved upon the son of the latter, Alp Arslan, who during the life of his father and uncle had distinguished himself for his bravery and generalship.

Alp Arslan, signifying the courageous lion, is the Turkish surname of this prince, whose original surname was Israel, and who received, on his embracing Mohammedanism, the name of Azzoddin, or strength of religion, from the khalif Kaim Bimrillah. The beginning of his reign was chiefly occupied with the suppression of revolts which were raised in various parts of the empire; and many singular stories are told of the uniform and almost miraculous good fortune which attended him. In A.D. 1070 he signally defeated the Greeks at Akhlat, a city near Lake Van; and in 1071 again encountered a larger army of this nation, commanded by the emperor Romanus Diogenes in person, completely routed his army, and took the emperor himself prisoner. The generosity with which Alp Arslan restored to liberty his illustrious captive, is a frequent theme of praise with the oriental writers, who are fond of adducing this conqueror as an example of bravery, generosity, and the instability of greatness. Alp Arslan, after many important conquests in Georgia, set out on his long-projected expedition for the conquest of Turkestan, and in this he ended his life. Incensed at the obstinate defence of a fortress which he had taken, he bitterly reproached the governor of it, and ordered him to be cruelly put to death. The captive, taking a concealed knife from his boot, rushed upon the sultan; the latter, confiding in his own strength and unerring archery, bade his guards leave to him the punishment of the rebel; the arrow of the unrivalled bowman for this once missed its aim, and Alp Arslan received a mortal wound. He died a few hours after, in the tenth year of his reign (A.D. 1073), confessing with his dying breath the presumption which had been the cause of his fate.

Malek Shah, surnamed Moezzeddin Abulfatah, son of Alp Arslan, succeeded his father in A.D. 1073, and in the beginning of his reign defeated his two uncles who had rebelled against him; one of these he afterwards poisoned in prison, as he found that his own troops were growing mutinous in the idea of making the captive their leader. In 1075, Aftis, one of the generals of Malek Shah, took Damascus, and subdued the greater part of Syria, but was unsuccessful in an attempt to possess himself of Egypt. Malek Shah himself reduced Mawarannahr (the country beyond the Jihun) in A.D. 1078, and two years afterwards made preparations to invade the dominions of Ibrahim, the ninth Gaznevide sultan. This intention however he was prevailed upon to relinquish, and he received in marriage the daughter of Ibrahim. In 1090 the successes of the Batanians, or Assassins, made Malek Shah send them an embassy, requiring obedience in a somewhat threatening tone; but the singular proof which the ambassador received of the devotion that these men bore their master (three of them having slain themselves successively at his command), induced the sultan to suspend his proceedings against them. Shortly after, the vizir Nizam-al-Mulk, who had been disgraced a little time before, was murdered by an emissary of this fraternity. Malek Shah died at Bagdad in 1092, leaving behind him the reputation of being the greatest of the Seljukian princes.

Barkiarok, the elder son of Malek Shah, was the virtual successor of his father, though the latter had left his kingdom to his younger son Mahmud, then only six years old, under the guardianship of his widow Turkhan Khatan. The queen-regent fixed herself in Ispahan, where she was besieged by Barkiarok; but fearing a revolt of the citizens, she consented to divide the government with her stepson, taking for Mahmud the province of Ispahan and its dependencies, while she left to Barkiarok the rest of his father's dominions. The death of the infant prince shortly after however devolved the separated province again upon Barkiarok. His next opponent was his uncle Tajaddowlet Tatash, governor of all Syria, who was defeated and slain in A.D. 1095; and this revolt was followed three years after by that of Mohammed, younger brother of Barkiarok, who, by the mutiny of the troops of the latter, gained possession of Irak without striking a blow. From this date till A.D. 1104 the brothers were engaged in perpetual skirmishes, which were ended by a treaty in the year last mentioned, giving to Mohammed Syria, Mesopotamia, Mousul, Azerbijan, Armenia, and Georgia, and leaving Barkiarok in possession of the rest. He died however in the year when this treaty was concluded, appointing as his successor his son Malek Shah. During this reign the Crusaders entered Syria.

Mohammed, the brother of the late king, was too powerful to permit the succession of an infant prince; and on the death of his brother he marched to Bagdad, where he was invested with the sovereignty. He conquered part of India, and refused an immense ransom for an idol, which he ordered to be placed as the threshold of a magnificent college built at Ispahan, that the feet of the faithful might perpetually trample on it. He died A.D. 1117, appointing his son Mahmud Abulcassem his successor.

Sanjar however, brother of the late king, who had held the government of Khorassan under him and his predecessor during twenty years, took advantage of his power to claim the succession, leaving to Mahmud the province of Irak. In 1127 died Kothboddin, the Kharezm Shah, or king of Karazm. This dominion, originally dependent upon the office of chief cupbearer, to which the revenues of Kharezm were annexed, had grown into a virtual sovereignty, and though Kothboddin and his son Atsiz had actually performed alternately the office by which they held their land, the latter harassed the sultan Sanjar with perpetual hostilities, and is generally considered as the first actual sovereign of a dynasty which eventually overturned that of the Iranian Seljuks. In 1153, Sanjar, after gaining a signal victory over the sultan of Gaur, was taken prisoner by the Turkmans, whom he had attempted to chastise for nonpayment of their tribute, and detained by them for four years. He escaped by a stratagem, but died the year after his restoration to liberty, of grief, it is said, at the ravages committed by the Turkmans during his captivity. He died in 1157, after a reign of forty years. He was succeeded by Mahmud, the son of his sister, who governed for five years in Khorassan, after which he was defeated and deprived of his sight by a rebel, who shared with the sultan of Kharezm the province of Khorassan, and thus put an end to the Seljukian dominion there. Between Sanjar however and Mahmud, the Eastern historians count three Seljukian sultans.

Mahmud Abulcassem, already mentioned as sultan of Irak, and his two successors in that dignity,

Togrul and

Massoud. The reigns of these sultans, the last of whom died before the close of Sanjar's reign, are chiefly remarkable for their dissensions with the khalifs of Bagdad, and for the establishment of a new dynasty, that of the Atabegs of Irak. With the death of Massoud, in A.D. 1152, ended the domination of the Seljuks in Irak. Of his successors,

Malek Shah II., who is variously represented as the grandson or great-grandson of Malek Shah I.,

Mohammed II., brother of Malek Shah, and

Suleyman Shah, son of Mohammed I., and

Malek Arslan, his nephew, little is recorded but their mutual dissensions and alternate depositions one of the other. The last-named of these died in A.D. 1175, and was succeeded by

Togrul II., the last sultan of this dynasty, reigned 18 years, perpetually insulted and harassed by the Atabegs of Bagdad, and was at last slain in a contest with them in 1193.

The Seljuks of *Kerman*, or *Karamania*, beginning their empire with this province, extended it afterwards to Fars, Mekran, part of Segestan and Zabulistan, and perhaps part of India. The first of this line was

Kaderd, nephew of Togrul Beg, who appointed him governor of Kerman, A.D. 1041. He was poisoned in 1072, by his nephew Malek Shah I., who had taken him prisoner in an attempt to invade his dominions. He left his dominions to his son

Soltan Shah, who was permitted by the conqueror of his father to assume the government of them. He died A.D. 1074, or, according to other authorities, in 1084. The remaining princes of this dynasty are—

Turan Shah, died 1095.

Iran Shah, his son, slain by his subjects for his cruelty, A.D. 1100.

Arslan Shah, nephew of the last mentioned, reigned in peace 42 years, leaving his crown, A.D. 1141, to his son

Mohammed, who died A.D. 1156.

Togrol Shah, son of Mohammed, died 1167, leaving three sons,

Arslan Shah,

Baharam Shah, and

Turan Shah, who reigned alternately as each could wrest the kingdom from the others, until Turan Shah left the kingdom to

Mohammed Shah, from whom it was taken by Malek Dinar, who conquered Kerman in 1187, thus terminating this dynasty.

The Seljuks of Rum (a name somewhat loosely applied to the dominions of the Greek emperors in Asia, but here including Asia Minor and part of the rest of what is now Turkey in Asia) take their origin from Kotolmish, nephew and general of Togrul Beg, who being sent by his uncle against the Greeks, and failing in his enterprise, rebelled from fear of his sovereign's displeasure. After long hostilities, which outlasted the life of Togrul Beg, his successor Alp Arslan concluded a treaty with Kotolmish, in which it was agreed that the latter and his heirs should hold all the territory he could take from the Greeks, and that the sultan should furnish him with assistance for that purpose. In consequence of this arrangement, Kotolmish and his sons gained possession of Persarmenia, Lycaonia, Cappadocia, and Bithynia; these conquests were left to

Suleyman, one of the five sons of Kotolmish, who is considered to have begun his reign as the first Seljuk sultan of Rum, A.D. 1087. There is however some discrepancy between Oriental and Greek historians as to the source of Suleyman's power, the latter deriving it from an independent grant made to him by Alp Arslan, and not from his father Kotolmish. Suleyman took Nice and Antioch, but was slain in 1085, under the walls of Aleppo, by the governor of Damascus, Tajoddowlat, having been engaged during the greater part of his reign in assisting one competitor for the Greek throne against another, and in taking advantage of their quarrels for his own aggrandizement. After an interregnum of nine years, he was succeeded by his son

Kilij Arslan, of whom little is recorded by the Oriental historians, and who is mentioned by the Greeks only in connection with their own history. He repaired Nice, and fixed his government there, but was driven from it by the Greeks and Norman crusaders. After a reign troubled by perpetual assaults of the two powers just mentioned, he was drowned in an action against the general of Mohammed, sultan of Irak, after taking possession of Mosul at the invitation of the inhabitants. The Greek writers introduce after him a sultan not mentioned by the Oriental historians, whom they call

Saysan, who, they say, after suffering several defeats from the Greeks, made with them a treaty greatly to the advantage of the latter, but was treacherously blinded and afterwards murdered, A.D. 1116, by

Masoud, his brother, who reigned till A.D. 1152, when he was succeeded by his son

Kilij Arslan II., an active and prudent prince, who dispossessed his two brothers of their share of the kingdom left by his father, availed himself of the friendship or folly of the emperor Manuel to procure supplies of money for raising soldiers, and in a contest with Manuel, originating in the building of two forts by the latter, he defeated the emperor in a sanguinary battle, and obtained as an article of peace the destruction of the forts. This treaty, being only partially fulfilled on the emperor's side, gave occasion to fresh hostilities, in the course of which Manuel died, and which ended in the aggrandizement of Kilij Arslan. In his old age, having divided his kingdom among his sons, he was treated by them with great unkindness; and Kothboddin, to whom Iconium had fallen, with the possession of which the succession to the empire was usually connected, imprisoned his father. The latter however contrived to make his escape, and was reinstated in his kingdom by his son Kai Khosrou. In consequence of this, Kai Khosrou was invested with the government of Iconium, which had been taken by him from his brother; and he succeeded his father in the kingdom. At the death of the latter, A.D. 1192,

Kai Khosrou, surnamed Gaiathoddin, obtained several successes in the beginning of his reign against the emperor Alexis; but in 1198 he was dispossessed by his brother

Rokneddin, who, taking advantage of the death of his brother Kothboddin, seized not only upon his dominions, but also on those of his other brothers. He died A.D. 1203, leaving his son

Kilij Arslan III., a minor, from whom however the throne was wrested almost immediately on his accession by his uncle the deposed sultan Kai Khosrou, who thus recovered his lost dignity. He reigned after this, says the Oriental history, with great power and dignity: he was afterwards concerned in the disputes of the pretenders to the Greek empire, and in one of these he perished in a personal encounter with Lascaris, one of the competitors. He left two sons,

Azzoddin Kai Kaus, who died after a reign of a year, A.D. 1219, and

Alaoddin Kaikobad, who succeeded his brother. He is the Aladdin of the writers on the Crusades; and was one of the greatest princes of this dynasty. He extended the dominions of his family in the East, and governed with extraordinary prudence and firmness. He died in 1236. His son

Gaiathoddin Kai Khosrou II. was a voluptuous and uxorious prince, during whose reign the dominions of his house became tributary to the Mogols. He died A.D. 1244. His son

Azzoddin succeeded him, and being required by Oktay, the khan of the Mogols, to come to do him homage, he sent his brother Roknoddin in his stead. The result of this was, that when a Tartar lieutenant or viceroy was sent into Rum, it was with the commission to put Roknoddin in the place of his brother. A division was afterwards effected, Azzoddin receiving the Western and Roknoddin the Eastern provinces. Azzoddin however was again deposed, and Roknoddin, whom he had attempted to murder, was placed in his room by the Tartars. On this occasion Azzoddin fled to the Greek emperor (A.D. 1261), who for some time amused him with promises; but at length Azzoddin, perceiving or fearing the emperor's intention to make him prisoner, intrigued to bring the Tartars upon the emperor, and thus escaped. After this his name does not appear again in history. Of the remaining sultans,

Kai Khosrou III., son of Roknoddin, slain A.D. 1283;

Gaiathoddin Massoud II., son of Azzoddin Kai Kaus, who died A.D. 1288; and

Kai Kobad, the nephew of Massoud, who was put to death A.D. 1300, little is on record beyond the dates annexed to their names. From the time of Gaiathoddin Kai Khosrou, the Seljuk sultans had been in fact mere pageants under the actual government of the Mogols, who summoned them to do the most servile homage, deposed and set them up, and even put them to death at their pleasure. Out of the wrecks of this empire arose that of the Othmans, or Turks, founded by Othman, a Seljuk captain. (D'Herbelot; *Mod. Univer. History*; &c.)

SELKIRK, ALEXANDER, was born at Largo, on the coast of Fife, in 1676, and bred to the sea. Having engaged in the half-piratical half exploring voyages in the American seas, into which the spirit of adventure then led so many of our countrymen, he quarrelled with his captain, one Straddling, by whom he was set on shore on the uninhabited island of Juan Fernandez, with a few books, his nautical instruments, a knife, boiler, axe, gun, powder and ball, for his whole equipment, in September, 1704. After four years and four months' residence, he was taken off by two English vessels, commanded by Capt. Woodro Rogers, in February, 1709, in the account of whose voyage we find the following passage:—'At first the terror and loneliness of the place sunk deeply on his spirits; but in time he became inured to it, and got the better of his melancholy. He had erected two huts, one of which served him for a kitchen, the other for a dining-room and bed-chamber; they were made of pimento wood, which supplied him also with fire and candle, burning very clear, and yielding a most refreshing fragrant smell: the roof was of long grass, and his wainscoting the skins of goats, near five hundred whereof he had killed during his residence here, and caught above five hundred more, which he marked on the ears, and then set at liberty. When his ammunition was exhausted, he caught them by running; and so practised was he in that exercise, that the swiftest goat on the island was scarcely a match for him. On his being first abandoned here, he relished his food, which was boiled goat's flesh and craw-fish, but indifferently, for want of salt; however, in time he got the better of the nicety of his palate, and was well enough pleased with the seasoning of the pimento fruit. When his clothes were worn out, he made himself a covering of goat-skin, joined together with thongs which he had cut with his knife, and which he run through holes made with a nail instead of a needle: he had a piece of linen by him, of which he had made a sort of shirt, and this was sewn in the same manner. He had no shoes left in a month's time: his feet, having been so long bare, were now become quite callous; and he was some time on board before he could wear a shoe. The rats at first plagued him very much, growing so bold as to gnaw his feet and clothes while he slept: however, he soon taught them to keep at greater distance, with the assistance of some cats that had been left ashore by the ships; of these and a few kids he made pets, and used to divert himself by teaching them a thousand tricks.' He had one narrow escape, having fallen over a precipice while in the act of catching a goat: on recovering his senses, he found the animal dead under him. Thirty years after, the first goat shot by Anson's crew was found to be marked as above described. After his knife was worn out, he managed to forge others from old iron hoops. He had some difficulty in returning to the use of speech, and in reconciling himself to the ship's provisions and to spirits. Rogers made him his mate, and he returned to England in 1711. It is said that he gave his papers to Defoe, who stole from them the story of 'Robinson Crusoe;' but the above extract, which on that account we have given at full length, shows that whatever communications may have passed between Defoe and Selkirk, the former can have borrowed little beyond the mere idea of a man being left alone on a desert isle, there being scarcely anything common to the adventures of the real and the fictitious solitary. (*Voyage of Capt. Rogers*, in *Collect. of Voyages*, 12mo., Lond., 1756; Chalmers, *Biog.*)

SELKIRK. [SELKIRKSHIRE.]

SELKIRKSHIRE, an inland county of Scotland, bounded on the north by Edinburghshire, on the east and south-east by Roxburghshire, on the south and south-west by Dumfriesshire, and on the west and north-west by Peeblesshire. A small detached part of the county lies just beyond the eastern boundary, entirely surrounded by Roxburghshire. The form of the county is very irregular, the greatest length is from south south-west to north-north-east, from Whin Fell at the source of the Ettrick, on the border of Dumfriesshire, to the source of the Cadon, on the border of Edinburghshire, 28 or 29 miles; the greatest breadth at right angles to the length, from Houndlesshope heights on the borders of Peeblesshire to the banks of the Borthwick Water, near Roberton Kirk on the border of Roxburghshire, 17 miles. The area is stated by MacCulloch (*Statist. Account of British Empire*) at 264½ square miles, viz. 263 square miles of land and 1½ mile of lochs. The population in 1801 was 5070; in 1811, 5889; in 1821, 6637; and in 1831, 6833; showing an increase in the last 10 years of 196, or about 3 per cent., and giving only 26 inhabitants to a square mile. Of the thirty-two Scottish counties (Ross and Cromarty being taken together) it is the twenty-fifth in size, the lowest in amount of population, and the twenty-ninth in density of population. Selkirk, the chief town, is on the south-east bank of the Ettrick, 31 miles in a direct line south-south-east of Edinburgh, or 36 miles by the road through Middleton.

Surface; Geology; Hydrography; Communications.—The whole county is hilly, but especially the southern and western parts, which are the highest, the direction of the principal streams being from south-west to north-east. The hills vary in height from a few hundred feet to two thousand.

We give the following table, compiled partly from Playfair's 'Description of Scotland' (P) and MacCulloch's 'Statistical Account of the British Empire' (M), but chiefly from the *New Statistical Account of Scotland* (SA). There is probably no part of the county much less than 300 feet above the level of the sea.

In the northern part of the county, north of the Tweed.

	Feet
Windlestraw Law	2295 (P)
Meigle Hill near Galashiels .	1480 (SA)

Between the Tweed and the Yarrow.

	Feet.
Peat Law	1964 (SA)
Three Brethren Cairn . .	1978 (SA)
Hainingshaw, or Hangingshaw Law	1780 (P) 1980 (SA)*
Minchmoor	1877 (P) 2280 (SA)*
Blackhouse, or Black Hoe Heights, on the western border of the county	2370 (P, M, and SA)*

Between the Yarrow and the Ettrick.

	Feet
Ward Law	1900 (P) 1986*(SA)

Between the Ettrick and the Borthwick Water.

	Feet.
Ettrick Pen	2220 (P) 2200 (SA)†
Old Ettrick Hill	1860 (SA)†
Shaw's Hill	1212 (SA)*

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* These heights, it is said in the 'New Statistical Account,' are from Ainslie's Map of the county, but that their accuracy is doubtful.

† These heights are said to be probably less than the actual elevation.

The best idea that can be formed of the mountains of this parish (county) may be gathered from what they appear once to have been, namely, one large high bed of greywacke and clay-slate, now cut by the larger streams into long-shaped divisions, and cross-cut by the smaller streams to a less depth, and into smaller and rounded divisions.' ('General Remarks on the County of Selkirk,' by the Rev. N. Paterson, minister of Galashiels, in the *New Statistical Account of Scotland.*) The hills are generally ridge-shaped and rounded on the tops, having acclivities of from 10° to 30°. The projecting ridges on one side of a valley usually have a corresponding recess on the opposite side. The west and south-west sides of the transverse or smaller valleys are generally the steeper. The strata for the most part dip to the north-east, but with various degrees of inclination. At New House Lynns, 7 miles above Selkirk, the rocks which form the bank of the Ettrick rise to a surprising height perpendicularly; both here and at Newark on the Yarrow the strata are remarkably curved.

On the western side of the county, toward Peeblesshire, extensive strata of porphyry are found alternating with thin strata of slate and granite.

None of the more useful minerals, coal, lime, or sandstone, are found, at least in quantity and condition such as to be available for economic purposes; attempts have been made to find coal, but without success. (*New Statist. Account,* 'Galashiels Parish.') Shell-marl occurs abundantly near Galashiels, and was extensively used for manure, until superseded by the introduction of lime from other counties; granite and whinstone are abundant.

Selkirkshire is comprehended in the basin of the Tweed. The Tweed itself crosses the county in the northern part, from west to east, quitting it just at the junction of the Gala, which may be regarded as the lowest spot of the county, 280 feet above the level of the sea; about 10 or 12 miles of the course of the Tweed belong to Selkirkshire. The Ettrick may be regarded as especially the county river; it gave to the district the name by which it was formerly known, of Ettrick Forest. It rises in the south-west corner, and flows in a tolerably direct course north-east till it joins the Tweed on its right bank, on the border of the county a little above Abbotsford; its course may be estimated at from 28 to 30 miles. The Yarrow rises on the western border, and has its course nearly parallel to the Ettrick, until it reaches Yarrow ford, where it turns to the south-east and joins the Ettrick a little above Selkirk; its course may be estimated at about 20 miles, including the lochs of the Lowes and St. Mary's, through which it flows. The Gala, which has the greater part of its course in Edinburghshire, and the Cadon, belong to the northern part of the county; they flow south-east, and join the Tweed on the left or north bank; the Gala on the border of the county, the Cadon a little above it.

The principal lochs are those of the Lowes and St. Mary, separated from each other by a very narrow neck of land. They are both expansions of the Yarrow, which enters the loch of the Lowes at its upper end and quits that of St. Mary at its lower end. The former is a mile long, a quarter of a mile broad, and about seventy feet in depth; that of St. Mary is three miles long, half a mile broad, and from eighty to ninety feet deep. They are at an elevation of 560 feet above the level of the sea. This loch is beautifully described by Sir W. Scott, in 'Marmion,' introduction to Canto ii.

The lochs are stored with pike, perch, eels, trout, and minnows; the rivers with salmon, trout, eels, barbels, and other fish.

The principal road in the county is the mail-road from London by Carlisle to Edinburgh; it enters the county near Selkirk and passes through Selkirk and Galashiels. A branch from this road parts from it at Selkirk, and passing by Yair Bridge, reunites with the mail-road at Crosslee, nine miles north of Selkirk. A road from Glasgow to Kelso and Berwick crosses the county, following the valley of the Tweed. The late Lord Napier did much for the improvement of the roads, especially in Ettrick parish.

Agriculture.—'The arable land of the county lies on an elevation of from 280 to 800 feet, none of it therefore is the best as to climate. . . . . . Wheat abounds in the lower districts, and has been raised, at the height of 700 feet, to what would be called a good crop in the Lothians; and, considerably higher, near to the head of Ettrick, oats, turnips, barley, and clover hay thrive in regular rotation.' (*New Statist. Account.*) In Selkirk parish the soil is light and dry, and the harvest comparatively early. The rotation is usually of five years, but where manure can be easily procured, it is sometimes reduced to four, but this has been followed by injurious consequences. The quantity of land constantly or occasionally under tillage is however very small, and the dampness of the climate renders the county altogether more appropriate for pasturage.

The cattle are chiefly of the Teeswater breed, or rather are a mongrel kind of the short-horned varieties. A considerable number are reared yearly. Many Highland cattle are also grazed on the hills, where they consume the coarse pasturage which the sheep will not touch. The black-faced sheep which had long been reared in the county was gradually superseded toward the close of the last century by the introduction of the Cheviot; but since then the black-faced have been again introduced on exposed mossy lands, where they are found to thrive best. Some Leicesters have been also introduced. The black-faced sheep have been crossed with the Cheviots and with the Leicesters; and on some of the farms, where the pasturage is best, the Cheviots have been crossed with the Leicesters.

Both in agriculture and pasturage great improvement has been made in the last half-century. The houses of the tenants have been for the most part rebuilt in better situations and in better style.

There are between 2000 and 3000 acres of wood and underwood: Scotch firs were formerly the favourite trees; but now, where the ground is dry, oak, ash, elm, beech, and plane are grown; with alder, birch, larch, spruce, and Scotch fir to shelter them when young. The indigenous wood is chiefly oak, cut down periodically for the bark, ash, elder, birch, elm, hazel, hawthorn, mountain ash, &c.

Divisions, Towns, &c.—The county contains nine parishes, or parts of parishes, as follows:—

		1831.		
Parish.	Situation.	Inhabited houses.	Families.	Population.
Ashkirk	S.E.	38	41	192
Ettrick	S. and S.W.	88	89	530
Galashiels	N.E.	199	270	1364
Innerleithen	N.	10	10	64
Peebles	W.			
Roberton	S.E.	55	60	306
Selkirk	E.	435	637	2833
Stow	N.E.	53	57	323
Yarrow	W. & Central	216	227	1221
		1094	1391	6833

Of these parishes, only two, Etterick or Ettrick and Yarrow, are wholly included in the county; Galashiels and Selkirk have each a small portion in Roxburghshire, and Ashkirk and Roberton belong chiefly to that county; Innerleithen or Inverleithen and Peebles belong chiefly to Peeblesshire; and Stow is mostly in Edinburghshire.

Selkirk town is on the right or south-eastern bank of the Ettrick, on the mail-road from London by Carlisle to Edinburgh. In the middle ages Selkirk was a town of some importance, as appears from its furnishing 80 men to the army of James IV. Of these only four or five returned from the fatal battle of Flodden, but they brought away an English flag, still preserved in the town. The bravery of the townsmen is thought to be contrasted with the supposed cowardice or treachery of Lord Home, in the following rhyme (of later date however than the conflict), given by Sir Walter Scott, in his 'Minstrelsy of the Scottish Border:'—

'Up wi' the sutors of Selkirk,
And down wi' the Earl of Hume;
And up wi' a' the bra' lads
That sew the single soled shoon.'

The townsmen are here termed sutors, that is, shoemakers, because they were at that time the principal class of artizans. Some of the municipal customs still observed indicate the superior importance of the members of 'the gentle craft,' and the word sutor is still used as an equivalent for 'burgess.' In the rebellion of 1745, above 2000 pairs of shoes were supplied by the townsmen, upon requisition, to the rebel army; and even to the present time the shoemakers are said to be more numerous than other handicraftsmen. Selkirk was burnt by the English in revenge for the gallantry of the townsmen at Flodden, but in what year is doubtful; the charters granted by James V. record the great injuries the town had suffered. (Scott's *Minstrelsy of the Scottish Border.*) In the civil war of Charles I., Montrose was quartered here with his cavalry, amounting to about 1000, while the rest of his army, 1200 or 1500 strong, encamped at Philiphaugh, about a mile west of the town. Here he was surprised and routed by the Covenanters, under David Lesly, A.D. 1645. This event has been commemorated in border song. ('The Battle of Philiphaugh,' in Sir W. Scott's *Minstrelsy, &c.*)

Selkirk has one principal street, expanding in one part into a triangular market-place, with a conspicuous public well in the centre. The town has much improved in modern times, and contains some good houses. The parish church, a large building, erected nearly a century ago, is in the town; and there are a Secession meeting-house and a town-hall with a spire 110 feet high. There is a bridge over the Ettrick, near the town. The population of the town, in 1831, was 1880. There are good flour-mills close to the town, some stocking-looms, and a fulling-mill, which employ a few hands, and a small tan-yard. The jealous restrictions on trade imposed by the burgesses are considered to have greatly injured the prosperity of the place. (*New Stat. Acct. of Scotland*, Sept., 1833.) There are a weekly market and five yearly fairs. There is a post-office, and the town has coach communication daily with Edinburgh. Selkirk was a burgh of antient foundation, but the earliest existing charter is of James V., A.D. 1535; the council consists of a provost, two bailies, a treasurer, and twenty-nine councillors. There are the usual burgh-courts, but the business done in them is trifling. There is neither separate police nor nightly watch; the only criminal officers are the burgh officers and constables ordinary and special. There is a small prison for the burgh and county. There are five incorporated trades. The burgh was formerly united with Peebles, Lanark, and Linlithgow in sending a member to Parliament; but by the Scottish Reform Act the burgh was, for parliamentary purposes, disfranchised, and united with the county. There were, in 1833, seven day-schools in the parish, viz. the parochial school, the burgh school, two others endowed, and three unendowed; and two Sabbath-evening schools, superintended by the clergymen, established and seceding. There were also a savings'-bank, a parochial library, two subscription libraries, and a reading-room supplied with newspapers and periodicals. There are a friendly, a missionary, and a temperance society.

Galashiels is on the right or south-west bank of the Gala, just above its junction with the Tweed, about six miles north-east of Selkirk. There is a bridge over the Gala, just above the town, which it connects with the village of Buckholmside. The town extends into the parish of Melrose, and contained, in 1831, a population of 2209, of whom 1130 were in Galashiels, and 1079 in Melrose parish. The town consists chiefly of one long street, with some bye-lanes and scattered clusters of houses, usually built of stone, and slated. The church, erected in 1813, is a 'semi-gothic' building, of considerable but inadequate size; and there are three dissenting chapels, one Seceders, one Baptist, and one Independent. The chief manufacture is that of woollens, for which there were, in 1831, ten large factories. At that time it was estimated that 21,000 stones of home-grown wool, 24lbs. to the stone, and 500 stones of Australian wool, were consumed. Nearly half of this was manufactured into yarns, flannels, blankets, shawls, and plaids; the other half into narrow cloth, and 'crumb cloth,' or carpeting, of grey or mixed colours. These branches of industry employed about 200 to 220 men, nearly 50 women, and 80 children. There were a bark-mill, and manufactories of machinery, but the town was not well furnished with shops. The market has fallen into disuse, and the fairs are ill attended. The Carlisle and Edinburgh mail now passes through the town, and there is abundant other coach communication with Edinburgh daily. Part of the town is included in the burgh of barony of Galashiels, governed by a baron bailie. There were, in 1833, five day-schools in Galashiels parish, viz. the parochial school, a subscription school, and a private school in the town, two private schools in the country, and a Sunday school conducted by the secession minister. There were also two subscription libraries, a reading-room, a savings'-bank for this and the adjacent parishes, and a friendly society.

Ecclesiastical Arrangements.—The parishes of Ashkirk, Ettrick, Galashiels, Roberton, Selkirk, and Yarrow are in the presbytery of Selkirk; those of Innerleithen (or Inverleithen), and Peebles in the presbytery of Peebles; and that of Stow in the presbytery of Lauder. The presbyteries of Selkirk and Lauder are in the synod of Merse and Teviotdale; and the presbytery of Peebles in the synod of Lothian and Tweedale.

History and Antiquities.—This part of Scotland appears to have belonged originally to the Gadeni, and in the period which succeeded the retreat of the Romans was overrun by the Anglo-Saxons of Northumbria. It appears to have been at this early period a forest, and to have had few if any settled inhabitants. With the exception of the Catrail, a remarkable entrenchment, consisting of a ditch, with a bank on each side, extending 28 miles through the county, there are very few British or Roman remains; no Druidical monuments, no cairns, or scarcely any, and no hill forts, except a few near the south-eastern border, with a square Roman camp, in Roberton parish, in the midst of them; and the traces of two camps and of a Roman road in Galashiels parish. After the cession of the southern part of Scotland by the Anglo-Saxon princes, the Scottish kings had a residence at Selkirk, antiently written Selechyrche, and perhaps Seleschirche. The period of its establishment as a shire is doubtful; it was probably before the death of Alexander III., but the first recorded sheriff was Alexander Synton, A.D. 1292. At a subsequent period the possession of the shire was disputed by the English and Scots. It belonged, in the latter half of the fourteenth and the former half of the fifteenth century, to the Douglases; in 1503 the hereditary sheriffdom was granted to Murray of Falahill, whose descendants held it, though not without interruption, till the abolition of hereditary jurisdictions in 1748. Several castles were erected in this county: there was one at Selkirk in existence early in the twelfth century, and occasionally used as a royal residence, and another castle near it, called Oldwark (old work), of both which there are now no remains. The ruins of Oakwood and Newark (that is, new work, as distinguished from the old work), both near Selkirk, are yet standing. It is in Newark that Sir W. Scott represents the duchess of Buccleugh as listening to 'the lay of the last minstrel.'

The exertions of James V. for securing the quiet of the border were so far successful that he was enabled to keep a flock of 10,000 sheep in Ettrick Forest in this county, to the great advantage of his exchequer, though Sir Ralph Sadler, the ambassador of Henry VIII., remonstrated against such 'mean' methods of increasing his revenues.

Dr. John Rutherford, professor of physic at Edinburgh, Alexander Cunningham, an historian of some note, and Mungo Park, the African traveller, were natives of this county. Sir Walter Scott was connected with it by his holding the office of sheriff, and by his residence at Ashiesteel, or Ashestiel, in Yarrow parish, where he produced his 'Marmion' and 'Lady of the Lake.' James Hogg was also long resident in Yarrow parish, and appears to have derived from that residence his usual designation of the 'Ettrick Shepherd.'

(*New Statistical Account of Scotland*; Chalmers's *Caledonia*; *Introductions and Notes to Sir W. Scott's Poetical Works, &c.*)

SELTER WATER. [WATERS, MINERAL.]

SELTZ. [RHIN, BAS.]

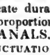
SELUM. [HINDUSTAN.]

SEMAPHORE. [TELEGRAPH.]

SEMECARPUS, a very small and entirely Indian genus of the natural family Terebinthaceæ, of which the name is derived from *semeion* (σημειον), a mark, and *carpos* (καρπὸς), fruit, from the remarkable property possessed by the juice of the fruit, whence it is commonly called *marking-nut*. The genus is characterised by having polygamous flowers; calyx 5-cleft; petals 5, oblong, sessile; stamens 5; disk urceolar; ovary free, sessile, girded by a tumid ring. Styles 3; stigmas obtuse, emarginate. Nut compressed, heart-shaped, seated on a depressed thickened torus. Pericarp hard and thick, containing between the inner and outer layers cells full of a corrosive resinous juice. *S. Anacardium*, the officinal Anacardium, or that which is more particularly called marking-nut, is the best known, and by some it is considered the only species of the genus, and the others merely as varieties; but *S. cuneifolium*, though resembling it a good deal, yet differing in habit, is very probably a distinct species, indigenous in the valleys of the Himalayan Mountains as far as 30° N. lat. Its fruit possesses the same properties, and is used as a substitute for the former species.

S. Anacardium has long been known for the corrosive resinous juice contained in the nut. This juice is at first of a pale milk colour, but when the fruit is perfectly ripe it is of pure black colour and very acrid, and in both respects resembles that of several other plants of the same family, as in the cashew-nut species of Rhus and some of the varnish-trees. The juice is employed in medicine by the natives of India and to mark all kinds of cotton-cloth. The colour is improved and fixed by a mixture of quicklime and water. This juice is soluble neither in water nor alcohol, unless it be previously alcalized, when the fluid becomes of a black colour. It unites perfectly with oils. The wood of the tree is not considered of any use, both on account of its softness and because the acrid juice renders it dangerous to cut down and work upon. The fleshy receptacles on which the seeds rest are roasted in the ashes and eaten by the natives, and are said to taste like roasted apples, though previous to the application of heat they are astringent and acrid. The vapours which rise during the roasting are deleterious. By boiling the nut, an oil is prepared which acts as a blister when undiluted. In smaller quantities it acts as an irritant and produces an eruption on the skin. A statement has been made of considerable difficulty having been experienced respecting the nature and origin of an eruption with which several men were simultaneously attacked in one of the European regiments in India. The circumstance was easily explained when it was discovered that the linen of the men had been marked with the juice of the marking-nut. The green nuts well pounded into a pulp make good birdlime. The bark is astringent, and gives various shades of a brown dye. A soft tasteless brownish-coloured gum exudes from the bark.

SEMIBREVE, a character in music, sometimes nearly circular in form, but more commonly elliptical. Ex.:



This is adopted as the measure-note in music; the other five characters that indicate duration, as minim, crotchet, &c., being considered as proportional parts of it.

SEMICIRCULAR CANALS. [EAR.]

SEMICOLON. [PUNCTUATION.]

SEMILUNAR VALVES. [HEART.]

SEMI-PELAGIANS. [PELAGIANISM.]

SEMIPHYLLIDIANS, the third division of Lamarck's Gastropods, consisting of those whose branchiæ are placed under the border of the mantle and disposed in a longitudinal series on the right side of the body alone. The Semiphyllidians respire water only. The two genera placed by Lamarck under this division are *Pleurobranchus* and *Umbrella*.

The INFEROBRANCHIATA of Cuvier consisted of the genera *Phyllidia* and *Diphyllidia* only; but M. Rang arranges under that order the *Semiphyllidians* as well as the *Phyllidians*, and the following is his definition of the *Inferobranchiata*:—

Animal furnished with a foot for creeping, always very large; branchiæ in the form of a long succession of foliations, at the lower part of the body between the projecting border of the mantle and that of the foot, either all round the body or on the right of it only*; the organs of generation always on the same individual; one or two pairs of tentacles.

Sometimes a *shell* either internal or external.

M. Rang thus defines his second family of the *Inferobranchiata* —

Animal with the branchiæ on the right side only (with the exception of the genus *Ancylus*, which is sinister).

Sometimes a shell, either internal or external, and in the last case set on the back (recouvrante).

Under the Semiphyllidians M. Rang arranges the following genera:—*Ancylus*, *Pleurobranchæa*, *Pleurobranchus*, *Umbrella*, *Spiricella*, and *Siphonaria*.

ANCYLUS. (Geoffroy.)

Generic Character.—Animal oval, conical, slightly recurved backwards; mantle not ample, not covering the head, and delicate upon the borders; head very large, furnished with two tentacles, which are stout, cylindrical, contractile, with eyes at their internal base, and approximated at their external side by a foliaceous appendage; mouth below, with some appearances of labial appendages on each side; foot elliptical, large; branchiæ in a sort of cavity in the middle of the right side, between the foot and the mantle; vent at the left side.

Shell delicate, covering the animal, nearly symmetrical, obliquely conical backwards, the base oval, more or less elongated, the apex pointed, but not marginal, and rather inclined to the right. (Rang.)

M. Rang observes that this genus has been bandied about from one family to another, and perhaps would be so still, notwithstanding what is known of the animal. However this may be, he adds, it can no longer be classed with the other genera of Mollusks with which it lives in fresh-water, because it is branchiferous, and they, on the contrary, are pulmoniferous. In the meantime, M. Rang places it in the family of Semiphyllidians, to which the disposition of its branchiæ seems to call it, remarking at the same time, that instead of having them on the right side like *Pleurobranchus*, it has them on the left; but he thinks this character of small importance, as the animal appears to be sinistrorsal.

Locality and Habits of the Genus.—Fresh-water; springs and streams; they creep on stones and aquatic plants. M. Rang states that he had never seen them respire air naturally.

Lamarck placed *Ancylus* at the end of his Calyptraceans [CALYPTRÆIDÆ] next to *Crepidula*. M. Deshayes, in the last edition of the *Animaux sans Vertèbres*, observes, that among the genera of Mollusks actually known, that of *Ancylus* is, without doubt, one of the most difficult to arrange correctly in the system. This, he remarks, would at first sight appear singular, especially as many are living in the fresh waters, and nothing would appear easier than to study the animal; but the difficulty lay in the small size of the species and the obstacle thus opposed to anatomical investigation. Those zoologists who adhered strictly to the Linnean system, confounded the genus with the *Patellæ*. [CERVICOBRANCHIATA.] Draparnaud was of opinion that it belonged to the *Scutibranchians*, and that the animal was furnished with a pectinated branchia upon the neck or in the cervical cavity, proper for respiring water. Férussac observing that they came sometimes to the surface, thought that they did so for the purpose of respiring air, and placed them among the *aquatic pulmonifera*. M. de Blainville included them in the same family as the *Haliotides* [HALIOTIS], acknowledging, at the same time, that it is very uncertain that this would turn out to be the definitive arrangement.

The Rev. Lansdown Guilding having an opportunity of studying species of some size in the island of St, Vincent, has figured and described two in the 'Zoological Journal,' vol. iii. He places them under the family Patelladæ, but with a mark of doubt, remarking that their smallness is an obstacle to the accurate use of the scalpel. Still his descriptions and figures are highly valuable, and we proceed to lay them before our readers:—

Animal unisexual, entirely covered by the shell; body soft, subdiaphanous; head distinct; cheeks rounded; mouth below, large; neck elongated, free; tentacles two, subulate, retractile; foot short; abdomen affixed; eyes under the base of the transparent tentacles; penis exserted at the roots of the left tentacle; anus at the left side; branch of the branchiæ small, near the anus and foramen of the side; mantle very ample, free, very thin, extended over the whole cavity (cavitatem totam lambens); the margin continuous and simple.

Progression.—Slow.

Young ovate, affixed to leaves by three pairs (per paria tria) under a common, rounded, gelatinous skin.

Shell patelliform, thin, obliquely conical; apex subacute, inflected posteriorly to the right; aperture oval; the margin simple and expanded.

With regard to the generation stated with a query by Mr. Guilding, M. Deshayes remarks that the *Ancyli* appear to be diœcious, that is to say, that each individual has equally the male and female organs.

Mr. Swainson (*Malacology*) places *Ancylus* with the River Snails, *Limnacinæ*, his fifth subfamily of *Helicidæ*.

M. Deshayes in his tables makes the number of species four living and three fossil (tertiary). In the last edition of Lamarck, he observes that the number of species known is greater than Lamarck supposes (3). He adds that Férussac makes the number of species, recent and fossil, 10, the amount of the latter being very small; and M. Deshayes adds his belief that many of them ought to be suppressed, but that they will be replaced by those recently brought home by voyagers. The number given in the last edition of Lamarck is five recent and one fossil; but *Ancylus obliquus*, Brod., and *Ancylus filosus*, Conrad (*Zool. Proc.*, 1832; Müller, *Synopsis*, 1836), do not appear among them.

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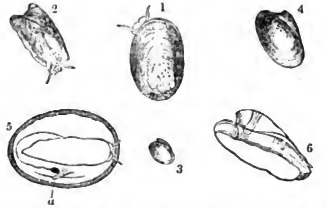
* M. Rang excepts *Ancylus*, which, being sinister, the branchiæ in this single instance are situated to the left only.

Examples.—*Ancylus irroratus* and *Ancylus radiatus*.

Description of Ancylus irroratus.—Pale-yellowish, obscurely sprinkled with black; front and abdomen reddish; eyes black; sole of the foot spotless and pallid.

Shell.—Concentrically plaited, subdiaphanous; epidermis black-green sprinkled with black; apex subobtuse, posterior; aperture roundish-elliptical; length three lines.

Locality.—Plentiful in the ditches of the island of St. Vincent, closely adhering to dried leaves by excluding the air.

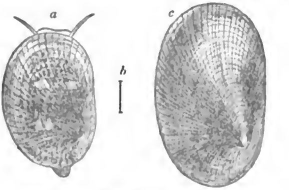


Ancylus irroratus. 1. Animal creeping, magnified; 2. Animal reversed; 3, 4, Shell; 5. Figure of the foot; *a*, branchiæ in situ; 6. Animal with the shell taken off.

Ancylus radiatus.—Yellowish, sprinkled with black, with three or four great pale spots on the back; face reddish; abdomen obscure.

Shell oval-elliptical, glassy, diaphanous, concentrically sub-plaited, radially striated, epidermis evanescent.

Locality.—Found with the preceding.



Ancylus radiatus.

a, animal creeping, magnified; *b*, nat. length of the shell; *c*, shell magnified. (Guilding.)

Fossil Ancyli.

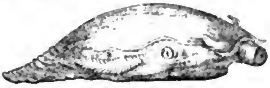
The geological localities assigned by M. Deshayes to the three fossil species noticed in his tables are Paris (2) and London (1). Eocene Period of Lyell. *A. elegans* is noted as a species found in more than one tertiary formation; and Auvergne and Cantal are mentioned under the head of 'Various Localities.' The locality of *Ancylus depressus*, Desh., the fossil species recorded in the last edition of Lamarck, is the neighbourhood of Versailles (the *meulières*).

Pleurobranchæa. (Meckel.)

Generic Character.—*Animal* oval, elongated, flat below, convex above, pointed behind: no trace of a mantle, only a slight long and narrow expansion of the skin at the middle of the right side. Head very large, with the mouth at the extremity of a proboscis. Two pairs of auriform tentacles, the anterior ones at the extremity of a muscular, transverse, frontal band; the posterior ones rather farther backward, and very much separated from each other. Foot very large, more extended behind than before; a single branchia fixed at the right side, and entirely exposed. Termination of the organs of generation in a common tubercle, in front of the branchiæ; the anus above these, and in the middle of their length. (Rang, after De Blainville.)

M. Rang observes that this genus is closely approximated to *Pleurobranchus*; for it only differs from it in the absence of the mantle, the disposition of the tentacles, and the place occupied by the anus, which is more forward than in *Pleurobranchus*, and he is of opinion that both might form one division, adding, that M. de Blainville thinks that it is the *Pleurobranchus Balearicus* of Delaroche, and the type of the genus *Cyanogaster* of Rudolphi.

Example, *Pleurobranchœa Meckeli*, *Pleurobranchidium Meckeli*, Blainv.



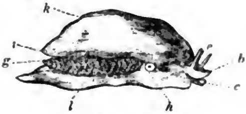
Pleurobranchæa Meckeli.

Pleurobranchus. (Cuv.)

Generic Character.—*Animal* oblong, fleshy, convex above, with a very large and overspreading mantle. Foot large, equally outspreading, and thus leaving a wide canal all round the body. Head distinct, furnished with a veil uniting on each side with the borders of the foot, and with two tubular tentacles, which are split anteriorly; mouth at the extremity of a proboscis; branchiæ composed of a double row of lamellæ, forming a plume on the posterior right side, between the mantle and the foot. Anus carried by a small tube behind the branchiæ. Organs of generation in front.

Shell.—Sometimes a rudimentary membranous shell, with a tolerably distinct apex, hidden in the thickness of the mantle.

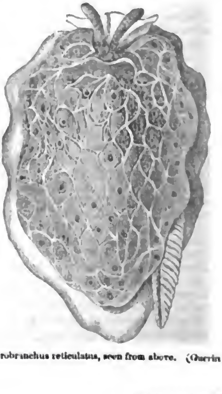
Such is the definition of M. Rang, who includes Berthella under the genus.



Pleurobranchus, side view.

b, veil; *c*, mouth at the extremity of a proboscis; *e*, tentacles; *g*, branchiæ; *h*, orifice of the organs of generation; *i*, position of the anus; *k*, mantle; *l*, foot. (Rang.)

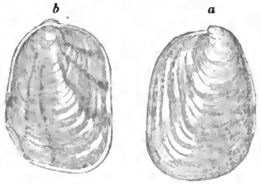
In the first edition of Lamarck, but one species, *Pleurobranchus Peronii*, is noticed. M. Rang remarks that the species are numerous, but that very few of them have been described. In the last edition of the *Animaux sans Vertèbres*, the number of recent species recorded is seven. No fossils are noticed.



Pleurobranchus reticulatus, seen from above. (Guerin.)

Locality and Habits.—Pleurobranchi have been found at depths varying from the surface to 30 fathoms on rocky coasts, stones, and sea-weeds.

Example, *Pleurobranchus reticulatus.* This species is not noticed in the last edition of Lamarck.



Shell of Pleurobranchus membranaceus.
a, external view; *b*, internal view.

FOSSIL PLEUROBRANCHI.

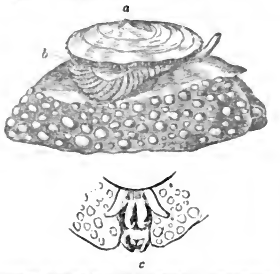
Grauwacke of the Taunus? *Geol. Trans.*, 2nd series vol. ii., pl. xxxiii.? Mr. G. B. Sowerby (*Genera*) remarks that there are no fossils which can be referred with certainty to this genus.

Umbrella (Lam.; Gastroplax, Blainv.).

Generic Character.—Animal oblong, very much depressed, convex above, very flat and fleshy below. Mantle not much extended. Head not distinct; mouth situated at the bottom of a narrow and deep notch in front of the foot, which has thick edges, and is raised all round: four tentacles; two superior, truncated, slit, and lamellose as it were internally; two smaller, in form of pediculated crests, on each side of the mouth. Foot very large, spreading out on all sides, smooth and flat. Branchiæ foliaceous, disposed in a *cordon* all along the right side, and reaching even a little to the left in passing by the front. Anus in the form of a small tube behind the branchiæ. Organs of generation very much approximated, situated to the right and forwards.

Shell external, calcareous, very much depressed, nearly entirely flat, irregularly circular, slightly convex above and concave below; apex excentric, conical, and slightly inflected; concentrically striated and radiated; edge trenchant, fixed to the dorsal part, which it covers. (Rang.)

M. de Blainville described this genus in the 'Bulletin Philosophique' (1819), and in the 'Dictionnaire des Sciences Naturelles,' from a specimen in the British Museum, which had the shell attached under the foot, probably by artifice, as he observes. In his 'Malacologie' (1825) he notices the error into which he had been led. Lamarck was startled at this strange anomaly, and expressed his disbelief that such could have been the actual position of the shell (*Animaux sans Vertèbres*, 1819), adding, that he had been assured by M. Matthieu, who had seen the animal alive at the Isle of France, that the shell was really dorsal. M. Rang's description was taken from a specimen deposited by M. Reynaud in the Museum of Nat. Hist. at Paris; but it had lost its shell. M. Deshayes, in the last edition of Lamarck (1836), remarks that he never comprehended nor adopted the opinion of M. de Blainville, on which he comments with some freedom and vivacity; adding, that his own observations, made on the Mediterranean species, having the shell still in its place, and those of Delle Chiaije, had for ever destroyed that opinion.



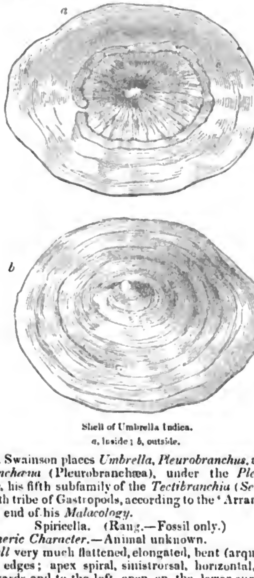
Umbrella Mediterranea, with the shell in the proper position.
a, shell; *b*, gills; *c*, head, viewed from above. (Philippi.)

Locality and Habits.—Littoral: depth, &c. much the same as in *Pleurobranchus.*

Two species only appear to be known, *Umbrella Indica* and *Umbrella Mediterranea.*

Umbrella Mediterranea.

Description.—Umbrella with a flattened shell; the disk of the lower surface not radiated.



Shell of Umbrella Indica.
a, inside; *b*, outside.

Mr. Swainson places *Umbrella, Pleurobranchus,* and *Pleurobranchæa* (Pleurobranchæa), under the *Pleurobranchinæ*, his fifth subfamily of the *Tectibranchia* (*Sea-Slugs*), his fifth tribe of Gastropods, according to the 'Arrangement' at the end of his *Malacology.*

Spiricella. (Rang.—Fossil only.)

Generic Character.—Animal unknown.

Shell very much flattened, elongated, bent (arquée), with sharp edges; apex spiral, sinistrorsal, horizontal, situated backwards and to the left, open on the lower surface; an indistinct impression, but appearing to occupy the posterior part of the shell, where it shows itself nearly parallel to the border.

M. Rang established this genus in the 'Bulletin of the Linnean Society of Bordeaux' (1828), for a small shell found by M. Charles des Moulins in the Faluns of Mérignac. Upon close examination, observes M. Rang, it presents strong relations with PILEOPSIS (vol. xviii., p. 156); nevertheless he had removed it to a considerable distance from that genus, because it presents truly distinct characters, such as having the borders of its aperture extremely dilated, so as to form a vast oblong surface, which serves as a base; and having the apex turned horizontally, and not entirely posterior; besides that it appears to him to have belonged to a much larger mollusk, which had secreted it for the protection of a single part of its body, the branchiæ for example.

The only species known to M. Rang is *Spiricella Unguiculus.*

Siphonaria. (Sowerby.)

Generic Character.—Animal oval, subdepressed; the head subdivided into two equal lobes, without tentacles, or apparent eyes.* Borders of the mantle crenilated. A branchia in form of a square membrane, in the sinus formed at the right, between the foot and the mantle.

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* See post, M. Quoy's description.

Shell patelloïd, elliptical, with the apex well marked, slightly to the left and posterior; a sort of canal or gutter on the right side; muscular impression of a horse-shoe shape, the right lobe divided into two by the canal. (Blainv.)

M. de Blainville remarks that although Adanson has placed this animal among the *Patellæ* (Lepas), it is evident that it ought to be a genus of the order MONOPLEUROBRANCHIATA; the divisions of the head being doubtless the tentacular auricles: and he refers it without doubt to those species of *Patellæ* on which Mr. G. B. Sowerby established his genus *Siphonoria*. M. de Blainville arranges that genus accordingly under his *Patelloidea*, between *Umbrella* and *Tylodina*.

M. Rang, who gives M. de Blainville's description in his 'Manuel,' observes that he does not know the animal of *Siphonaria*, but he remarks that he has seen young *Patellæ* with the character of *Siphonariæ*, the traces of which they preserve in a more advanced age; and it is only provisionally that he adopts the genus and assigns it a place among the *Inferobranchiata*.

But the most detailed description of the animal is given in the *Zoology of the Astrolabe* (Quoy and Gaimard), principally from *Siphonaria Diemensis*.

The cephalic hood is described as being very large, divided into two equal lobes, which are rounded and provided above with sessile eyes, but without any appearance of tentacles. The mouth is below, and the foot is oval and separated from the head by a transverse furrow. The animal pours out a viscous and whitish humour at pleasure; it is overspread by a mantle with a continuous border, but exposing on the right a tongue which raises itself in form of a sucker to close the common aperture of respiration and depuration; a little in front of this is the aperture of the female organ, and at the right side of the head is that of the male organ at the point where the tentacle would be if one existed. These two apertures are to be seen with difficulty.

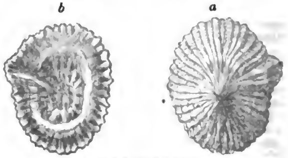
When the shell is removed, there are seen a horse-shoe-shaped muscle of attachment which is not interrupted except for a small space on the right at the place of the siphon; a very delicate mantle which permits the observer to see a rather transverse branchia, a little in the form of S; at its termination to the left in contact with the circular muscle, the heart surrounded by a viscous organ; and more backward, the rectum leaning upon the uterus. The branchial cavity is long transversely, but of small width from behind forwards. Its aperture is round. The buccal mass is large, rounded, bilobated, provided backwards with a small bladder as in the slug, and with a lingual riband with transverse denticles; two rather considerable salivary glands open into the œsophagus. The stomach which follows is but little distinguished from the œsophagus; the intestine makes a circumvolution in the liver, and is forthwith directed to the right: the rectum, which is always more narrowed, contrary to the usual structure in the greater part of the mollusks, goes along the side of the branchia, and opens upon the border of the pulmonary tongue. The liver has at least four lobes: they are difficult to separate, and partially embrace the intestine. Entirely behind and a little to the right, the ovary is affixed to one of the lobes of the liver; its twisted oviduct goes under the uterus, which has a bagpipe form, and the neck of which opens a little in front of the branchial sucker. On this viscus, a little turned upon itself, is applied the canal of the bladder proper to many of the pulmoniferous mollusks, the use of which is unknown. It is believed that its aperture is blended with that of the uterus. Above the digestive viscera and near the head is the testicle, a rounded mass, with a long deferent conduit folded back upon itself, communicating with a rather long intromittent organ recurved into a hook, having a retractor muscle, and proceeding to the place of its exit at the side of the right lobe of the head; the exciting organ did not appear to the describers to exist in all the species, or at least it was so small that they could not recognise it in the middle of that mass of viscera heaped one over the other. The brain, placed behind the œsophagus, is formed of two very distant ganglia, united by an upper cord; the lower, completing the circle, escaped the observer; from it passed a number of cords for the head, two among them, very distinct, go to the eyes; others are directed backwards for the viscera, the foot, &c.

M. de Blainville had previously found in the plates of the great work on Egypt the figure of an animal of *Siphonaria*, but, as it was unaccompanied by description, it had escaped the notice of most naturalists. M. Deshayes states, that having been long struck by the non-symmetry of the shells belonging to this genus, and having remarked the particular characters which distinguish them from the patellæ, he had formed, ever since 1825, in his collection, a small group for those species; but Mr. G. B. Sowerby was the zoologist who, in his *Genera*, established this genus, now universally adopted.

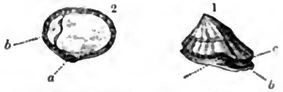
Mr. Swainson makes *Siphonaria* a subgenus of *Patella*, arranging it in his third tribe, 'Scutibranchia, *The Limpets*.' (*Malacology*.)

Locality and Habits.—Littoral: depth, &c. much the same as in *Pleurobranchus* and *Umbrella*. Brazil, the West Indies, Senegal, and Tristan d'Acunha. (Sowerby.)

M. Deshayes, in his tables, makes the number of living species of *Siphonaria* twenty-one, and that of the fossil species (tertiary) three. In the last edition of Lamarck the number of living species recorded is nineteen.



Shell of Siphonaria Sipho.
a, outside; *b*, inside.



Small species of Siphonaria, with the animal in the shell. 1. Lateral view 2, Ventral view. *a*, breathing aperture; *b*, head; *c*, mantle.

FOSSIL SIPHONARIÆ.

The number of fossil species (tertiary) stated in the tables of M. Deshayes is, as we have seen, three. The sole locality given is Sicily, for one species only. In the last edition of Lamarck the number of fossil species recorded is two, both from Dax.

SEMIQUAVER, a musical character, formed of a crotchet with two hooks added at the extremity of the stem, and is in duration $\frac{1}{16}$ of a semibreve. Ex.:

SEMI'RAMIS, a queen of Assyria, who, according to some, reigned about 2000, or, according to others, about 1250 B.C. Her whole history, as it has come down to us, is scarcely anything but a mass of fables. She is said to have been the daughter of the goddess Derceto, and of extraordinary beauty and wisdom. (Diod., ii. 4.) She became the wife of Onnes, who served in the army of Ninus, first king of Assyria, and followed her husband in the expedition of the king against Bactra. Semiramis showed the king how he might gain possession of the town. He followed her advice, and was victorious, and, being no less charmed with her beauty than with her judgment, he made her his wife, whereupon her former husband, in despair, put an end to his life. (Diod., ii. 6.) After a reign of fifty-two years, Ninus died, or, according to others, he was murdered by his own wife Semiramis (Aelian, *Var. Hist.*, vii. 1), and left a son Ninyas. According to some writers Semiramis took possession of the throne by the right of succession; according to others, she assumed the dress and appearance of her son Ninyas, and deceived her subjects, in this disguise, until she had accomplished such wonderful deeds that she thought it superfluous to conceal herself. She is said to have built Babylon and to have adorned it with the most extraordinary splendour, and all this in a very short time. She also built several other towns on the Euphrates and Tigris, to promote commerce among her subjects. (Diod., ii. 7-11.) On the main road in her dominions she erected an obelisk, 130 feet high, and laid out a magnificent park near Mount Bagistanum, in Media, and at the foot of the mountain she caused to be cut on the face of the rock her own figure and those of a hundred of her attendants, with Assyrian inscriptions. She is moreover said to have formed a large lake to receive the overflowing of the Euphrates, to have laid out several other parks near the town of Chauon, to have embellished Ecbatana, to have provided that town with water from Mount Orontes, and to have cut a high road through Mount Zarcaeum. All these things were done at her command, while she was traversing her own dominions with a numerous army. She left monuments of her greatness and power in every place that she visited. (Diod., ii. 14; Zonar., *Lex.*, ii. 1637.) From Persia she turned to the west, and conquered the greater part of Libya and Æthiopia. She also made war against an Indian king, Stabrobates, with a great army and a fleet on the river Indus. (Diod., ii. 16, &c.) Semiramis was at first successful, and numerous towns submitted to her, but at last she was wounded by the king, and entirely defeated in battle. According to some traditions she escaped to her own country, with scarcely the third part of her army; according to others, she fell in the battle; and a third tradition states that soon after her return she was murdered by her own son Ninyas. Some also believed that she had suddenly disappeared from the earth, and returned to heaven. (Diod., ii. 20.)

It is obvious that the history of the achievements of Semiramis is monstrously exaggerated in these traditions. With the exception of her name and the fact that she and her husband were the founders of the Assyrian monarchy, there is scarcely anything historical in them. It is not probable that the Assyrian empire at this early period extended much farther west than the Euphrates.

Herodotus (i. 184) mentions Semiramis as a queen of Babylon, and says that she dammed in the river, which before that time overflowed the country. But according to his calculation she must have lived about two centuries before Cyrus, and we must therefore either suppose that he is strangely mistaken in his chronology, or that he is speaking of a later queen of the name of Semiramis. (J. Scaliger, *Ad Chron. Euseb.* A. DLXXXIII.)

Remains of very antient buildings, with inscriptions in cuneiform characters, which are said to relate to the history of Semiramis, are found at Wan, which is called by the Armenians 'the City of Semiramis.' These ruins and inscriptions were examined, in 1827, by Schulz of Giessen.

SEMITONE, an interval in music, whose ratio is 16 : 15, as c c♯.

SEMLER, J. S. [RATIONALISM.]

SEMLIN is a fortified town in Slavonia, in the Peterwardin district of the military frontier. It is situated in 44° 50′ N. lat. and 20° 30′ E. long., on the right bank of the Danube at its confluence with the Save, on the declivity of a mountain opposite to the Turkish fortress of Belgrade, from which it is separated by the Save. It consists of the inner town and the suburb Franzensthal, and has 9300 inhabitants (according to Jenny, 12,000), among whom are a few Jews. In the inner town there are some good streets with stone houses, but on the whole it is by no means a pleasant place. There are one Roman Catholic church, four Roman Catholic chapels, two Greek churches, one synagogue, a German, a Greek, and an Illyrian school, an hospital, and a German theatre. Semlin is the seat of a Greek protopapas, and the residence of the Austrian commander of the district. Semlin has been chiefly remarkable as being the main point of communication between the Austrian and Turkish dominions, and containing the greatest quarantine establishment on the Austrian frontier. This establishment consists of a great quadrangle surrounded with a wall twelve feet high, in a meadow between Semlin and Belgrade, containing stone houses and large warehouses. At the east end of the town is the great market-place, where two rows of palisades separate the dealers, to prevent any hazardous communication. The transit trade is very important; the exports to Turkey, Bohemia, and Moravia are woollen cloths, porcelain, and glass; the imports from Turkey are cotton-yarn, Morocco leather, hareskins, lambskins, honey, and meerschaum pipes. The inhabitants are chiefly Servians, who settled there when Belgrade fell into the hands of the Turks in 1739, and the Servian language is generally spoken; the German however is nearly as general.

P.S. Since the above was written we learn from Vienna that the quarantine establishment between Servia, Moldavia, and Wallachia, and the other Turkish provinces, having been proved by several years' experience to be perfectly efficient, the quarantine between those three principalities and Austria is to be abolished, or at least much relaxed in strictness.

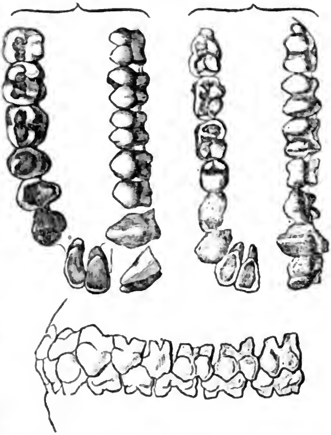
SEMNOON. [PERSIA.]

SEMNOPITHE'CUS. M. F. Cuvier's name for a genus of Monkeys.

Generic Character,—Canines much longer than the incisors. Head round; facial angle more open than that of the orang's; face flat. Limbs very long in proportion to the body; anterior thumbs very short. Cheek-pouches small or null. Callosities. Tail very long and slender.

Dental formula:—

$$\text{Incisors, } \frac{4}{4}\text{; canines, } \frac{1-1}{1-1}\text{; molars, } \frac{5-5}{5-5}=32.$$



Teeth of Semnopithecus. (F. Cuv.)

M. F. Cuvier observes that the canines are often much larger than the rest of the teeth, and consequently than they are here represented. This is exemplified in the case of *Semnopithecus Maurus*.

We have often had occasion to notice the value of comparative anatomy, not only as a physiological guide, but as a zoological test in the discrimination of genera. Mr. Ogilby, in the first volume of his interesting *Natural History of Monkeys, Opossums, and Lemurs** (we anxiously look for the second), well observes, that up to the time of the observations which we are about to cite, the title of the genus to the rank of a natural and scientific group rested upon a very insecure foundation; 'but,' adds Mr. Ogilby, 'the beautiful observations in question at once established it upon the basis of important and influential characters, and fully entitle it to the rank which it occupies among the natural genera of the quadrumanous family.'

Professor Otto had observed, in the dissection of *Semnopithecus leucoprymnus* (*Cercopithecus leucoprymnus*, Otto), that the stomach was of extraordinary capacity,† and he referred it, with a mark of doubt, to the genus *Cercopithecus*, under which title it appears in the *Manuel* of M. Lesson.

In 1833 the dissection of two species from the collection of the Zoological Society of London (*Semnopitheci Entellus* and *fascicularis*) enabled Professor Owen to lay before that Society the valuable paper published in the first volume of the *Zoological Transactions*.

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* 12mo., London, 1838.

† 'Nova Acta Academiæ Curiosorum,' vol. xii.

Professor Owen remarks that the genus *Semnopithecus*, which in the system of Cuvier ranks only fifth in the descending scale from man, is of late formation, and not entirely the result of newly discovered materials. On the contrary, several species were for a long time ranked with the *Guenons*, in which the stomach is of the usual simple construction; and the Professor does not omit to notice how slight is the essential zoological character—an additional tubercle on the last molar of the lower jaw—which distinguishes genera presenting such wide differences in the most important of their vital organs.

The larger of the two stomachs which formed the subjects of Professor Owen's examination was taken from a full-grown female *Entellus Monkey* (*Semnopithecus Entellus*, F. Cuv.) which measured from the end of the nose to the root of the tail 1 foot 8 inches. The admeasurements of the stomach, distended and dried, were—

	Ft.	In.	Lin.
Length along the greater curvature beginning at the left extremity . .	2	7	0
Length along the lesser curvature . .	1	0	0
Greatest circumference, a little to the right of the cardia	1	0	6
Smallest circumference (at about two inches from the *pylorus*) . . .	0	3	8

Professor Owen states that this stomach may be regarded as consisting of three divisions:—1st, a cardiac pouch, with smooth and simple *parietes*, slightly bifid at the extremity; 2nd, a middle very wide and sacculated portion; and 3rd, a narrow elongated canal, sacculated at its commencement, and of simple structure towards its termination. The latter division, from its greater vascularity, and the more abundant distribution of the nerves of the eighth pair upon it, is regarded by the Professor as the true digestive stomach. The preceding divisions appeared to him to be preparatory receptacles or reservoirs.

The *œsophagus* was found to enter into the left or cardiac division, which is separated from the middle division by a well-marked constriction. The diameter of this aperture of communication, when the stomach was forcibly dilated, did not exceed two inches; so that it seems to Professor Owen highly probable that when no distending force operates upon this part, the circular fibres which surround the constriction may, by the act of contraction, render the separation complete, and thus render the cardiac pouch a distinct cavity. A similar tendency to a separation of the cardiac from the pyloric moiety of the stomach has been observed to exist, in a greater or less degree, in stomachs of a much more simple structure, as in those of man and the Carnivora. It is probably the possession of this power in a greater degree, continues the Professor, that enables some men to regurgitate at will a small portion of the contents of the stomach, or to ruminate. [RUMINANTS, vol. xx, p. 223.] Such an action, he observes, is therefore still more likely to take place, occasionally at least, in animals which possess the complicated stomach of the *Semnopitheci*; and there is, he remarks, a provision in these stomachs for the passage of ruminated food, or such as is of a fluid or easily digestible nature, directly into the second or sacculated division. A ridge was continued along the pyloric side of the cardiac orifice obliquely to the fold in the middle division, which was situated beyond the constriction; a second ridge was continued from the right side of the *cardia* into the lower part of the *septum* that separates the cardiac from the middle compartment; and, consequently, between these ridges a shallow canal was continued from the œsophagus to the middle division of the stomach. Professor Owen observes, that supposing the circular fibres which form the two ridges to contract simultaneously with those forming the constriction above, the communication between the œsophagus and middle division of the stomach would in such case be cut off; but, on the other hand, if those fibres were relaxed, the food, and especially liquid food, would pass along the oblique canal directly into the middle compartment. Longitudinal fibres were continued from the œsophagus upon the cardiac division; but they gradually converged towards its left extremity, and there began to be collected into the narrow band which traversed nearly the whole of the greater curvature of the stomach. The extremity of the cardiac division was thus slightly indented, reminding the observer of the similar but more marked division of the same part of the stomach in the *Kangaroo*, which in other respects bears a strong resemblance to that of the *Semnopithecus*. The length of the cardiac division was three inches, and its greatest diameter three inches and four lines. The second or middle compartment of the stomach was composed of a double series of *sacculi* of different sizes, puckered up upon the longitudinal band above mentioned. Some of these *sacculi* were three inches in diameter, others one inch. They were formed principally at the expense of the anterior *parietes* of the stomach, and were eleven in number. The *septa* by which they were divided from each other were of a semilunar form, and projected into the cavity of the stomach to the extent of half an inch, and a few to that of an inch. The length of this part of the stomach in a straight line was 5½ inches, and its greatest diameter 5 inches. The third or pyloric division of the stomach commenced a little to the right of the œsophagus, where the second longitudinal band began. It was a narrow and almost cylindrical canal, gradually diminishing in diameter to the *pylorus*, bent in a sigmoïd form, and terminating by making a complete turn upon itself. It was only this part of the stomach which was puckered up on the two bands above described. The *sacculi* thus formed were however by no means so large or so completely separated from each other as in the preceding division; and they became gradually less distinct to within 5 inches of the *pylorus*, where they ceased altogether. A similar gradual disappearance of the *sacculi* was observable in the stomach of the *Kangaroo*. The whole length of this division, taken midway between the two curvatures, was 1 foot 6 inches; its greatest diameter was 2 inches, and its smallest 1 inch. Professor Owen guards against the inference that, in considering this stomach as being made up of three principal divisions, he is to be understood as supposing them to be equally distinct with the different cavities of a ruminant or cetaceous stomach. They were not characterized by any essential difference of structure, for none of them possessed a cuticular lining. The three divisions were however sufficiently obvious to justify their separate consideration for the facility of the description of so complicated an organ.

In another species (*Semnopithecus fascicularis*, the *Cro* of Sumatra, and *S. comatus*, Desm.) examined by Mr. Owen, the stomach presented precisely the same structure as the preceding. Its dimensions however were not quite so large in proportion to the size of the animal. The individual examined was younger than the *Entellus* whose stomach is above described.

Professor Owen remarks, that in consequence of the disproportionate size of the stomach in these animals, some differences are met with in the disposition of the other viscera of the abdominal cavity. The liver, instead of crossing the epigastric to the left hypochondriac region, extends downwards from the right hypochondriac to the right lumbar region, the whole of the opposite side of the abdomen, with the epigastric region being occupied by the enormous stomach. The liver is proportionately smaller in *Semnopithecus* than in *Cercopithecus* or *Macacus*. The spleen is of a more triangular shape, and is attached to the *omentum* continued from the left side of the stomach. The *pancreas*, on the contrary, is proportionately larger than in those genera. Both the biliary and pancreatic secretions enter the duodenum together, about three inches from the *pylorus*: were it not for the insertion of these ducts, Mr. Owen observes that one might almost suppose that what has been regarded as the true stomach was a portion of the intestinal canal.

The Professor further remarks, that with so complicated a stomach, it might also be expected that the intestines would not be so long as in those *Monkeys* which have a simple stomach; this however, he observes, is not the case, the small intestines being longer in proportion to the body in *Semnopithecus* than in either *Cercopithecus* or *Macacus*, the ratio being respectively as 8 to 1, 6½ to 1, and 4 to 1. Professor Owen points out that in this respect the latter genus evidently manifests its closer approximation to the carnivorous type. As in all the preceding animals the intestines were prepared for admeasurement in the same manner, Professor Owen believes that the relative proportions may be relied on, and he mentions this because the admeasurements given by M. Otto, of the *Semnopithecus leuco-*

prymnus, would lead to the conclusion that the intestinal canal was much shorter.

'What then,' asks Professor Owen, 'are the natural habits and food of this genus? Will future observers of these *Slow Monkeys*, as M. F. Cuvier denominates them, be able to ascertain that their natural food is more strictly vegetable than that of the *Cercopitheci*, &c.? And that, like the *Sloths* of the New Continent, so remarkable for their complex stomachs, they also crop the tender shoots and leaves of the trees in which they habitually reside? *Cercopitheci* and *Macaci* are provided by nature with receptacles (the cheek-pouches) for storing away ill-gotten food, hastily plucked from the cultivated grounds which they invade, and which they are thus enabled to carry off in sufficient quantity, and masticate and prepare for digestion in a place of safety. The complicated stomachs of the timid *Ruminants* are adapted to a similar end, allowing them to accumulate their requisite quantity of herbage from exposed pastures, which they then carry off to more secure situations, and remasticate at leisure. Now, in the *Semnopitheci* it is remarkable that the cheek-pouches are very small, or are wanting altogether. I have often fed the *Entellus Monkey* with nuts, and have observed that while his more fortunate neighbours the *Green Monkey* (*Cercopithecus Sabæus*, Geoff.) and *Chinese bonnetted Monkey* (*Macacus Sinicus*, Lacép.) were stowing them quickly away by the dozen into their cheek-pouches, he could not cram more than two in the same situation, and was equally averse to swallowing anything but the kernel. In this case the complicated stomach did not serve him as a substitute; but I think it very probable that it may compensate for the want of cheek-pouches when he is in a situation to collect together a quantity of soft fruits or herbs. In the gardens of the Society the *Semnopitheci* which have been there exhibited are fed exactly in the same manner as the other *Monkeys;* and the keepers have not observed anything like rumination in them. In both the species which I have dissected where illness and gradual decay preceded death, the stomachs were almost empty.' (1833.)

Mr. Ogilby refers to the observation previously made by Wurmb, in his description of the *Kahau*, remarking that Wurmb does not indeed enter into any particulars with regard to the complications, but that his expressions, 'that the stomach of the *Kahau* was of unusually large size, and of a very irregular form,' can apply only to the appearance since detected as generally characteristic of this organ in the *Semnopitheci*. This observation, he adds, had been lately confirmed by Mr. Martin, in a description of the stomach of the Kahau. The latter, whose paper will be found in the *Proceedings of the Zoological Society* (1837), also refers to Wurmb's short notice, and fully describes the complicated stomach as well as the intestines, of which the small were 18 feet in length, and the large 6 feet 2 inches. [NASALIS.] M. Ogilby further observes that the same structure of stomach has been since shown to exist in *Semnopithecus Maurus*, in the Douc (*S. Nemæus*), and in *S. cucullatus;* so that we are now certain of its being common to seven species of the genus, and may conclude with every probability that it extends to all the others. He alludes to the bezoars reported by many travellers to exist in the stomachs and intestines of the Asiatic monkeys, as confirmatory of Professor Owen's views, and adds that the bezoars produced by the monkeys of the Malay peninsula, and which can scarcely belong to a genus different from the *Semnopitheci*, are described as being smaller, rounder, and more powerful in their qualities than those obtained from ruminating animals. 'It is certain at least,' continues Mr. Ogilby, 'that they are more highly prized by Eastern nations, and the fact of their production, taken in connection with the complicated form of the stomach, in two groups of mammals, in other respects so widely separated from one another, offers a curious and interesting analogy between the semnopithecs and ruminants, and an additional argument in favour of the supposition advanced by Professor Owen.' Mr. Ogilby further remarks that the teeth of the *Semnopitheci* present analogous modifications to those which have been above described as characteristic of their stomachs. The number of the teeth, as well as their composition, are indeed, he observes, the same as in all the *Simiæ*, but their form, he adds, differs considerably from that of the other monkeys, and, like so many other details of their structure, approximates them more nearly to the gibbons. 'In the cercopithecs and baboons,' says Mr. Ogilby in continuation, 'the molar or cheek teeth are extremely tuberculous, and present a number of mammilated points, which are scarcely ever worn down by the effects of detrition; whilst, on the contrary, these same teeth in the semnopithecs become triturated at an early period, so as to present a hollow cavity in the centre. This betokens a corresponding motion in the jaws in the act of mastication, that is to say, a longitudinal grinding motion from front to rear, during the continuance of which the teeth rub against and wear one another down. Now such a motion is clearly unnecessary to an animal which lives upon nuts or soft pulpy fruits, which require only to be bruised by opening and shutting the mouth alternately, and not ground by rolling the jaws upon one another; its existence therefore in the semnopithecs seems to betoken some peculiarities in the regimen of these animals, with which we are at present unacquainted, more especially when taken in conjunction with the modifications already noticed as existing in the stomach and bowels; and it is hoped that this curious and interesting subject will attract the attention of some of our numerous countrymen resident in India, many of whom are well qualified to investigate it, and who have already enriched the zoology of that country with many valuable observations.'

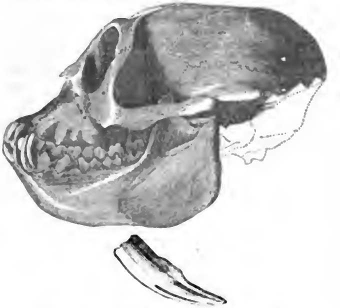
The other zoological characters of this genus are thus graphically given by the same author, in the same work: 'The extremities of the semnopithecs are of great length, compared with the dimensions of the body. This is another instance in which the semnopithecs resemble the gibbons, as well as in the slender and elongated form of the body itself; but there is this remarkable distinction, that, whilst the anterior pair of extremities in the gibbons is beyond all proportion longer than the posterior, the proportions are reversed in the semnopithecs, and it is the posterior extremities which exceed the anterior in length. Still the disproportion is by no means so great as that which exists in the gibbons, nor does it in the slightest degree impede the quadruped motion of the animals, when they are forced to resort to that mode of progression; but it becomes an additional evidence, particularly when taken in conjunction with other traits, of the superior development of the abdominal over the pectoral members, and the consequent degradation of the animals in the scale of existence. This evidence is still further strengthened by the very limited development of the thumb on the anterior extremities, which, as has been already observed, scarcely exceeds the tuberculous form, and enters but slightly into the functions of prehension and manipulation: thus, as it were, preparing the way for its entire disappearance in the colobs. [COLOBUS.] The organ consists nevertheless of the ordinary number of phalanges of which it is composed in other cases; but they are greatly abridged in their dimensions, both as regards thickness and length, and form a remarkable contrast to the rather immoderate development which marks the rest of the members. The tails likewise are much longer in the semnopithecs than in any of the ordinary monkeys. Though slender however, they possess a very considerable degree of muscular power, and enter as a very important constituent into the motions and progression of the animals. When at rest and unemployed, they are allowed to hang down perpendicularly, and, from their great length, which considerably exceeds that of the animal's body, have a very droll effect, which is heightened by the natural apathy and imperturbable gravity of the creatures themselves. This, when unemployed, is their natural position. They exhibit the very picture of sadness and melancholy, and appear as if perfectly regardless of everything that passes around them; but when roused or excited, they are nevertheless capable of the most surprising exertions, and astonish the spectator by a rapidity, variety, and precision of movements, which could scarcely be anticipated from creatures apparently so apathetic in mind and delicate in body. They are in reality far from meriting the name of Slow monkeys, which some zoologists have given them; their slowness is exhibited in disposition rather than in action, and is an attribute of character rather than of structure. When young they are readily domesticated; but being less petulant, curious, and restless than the cercopithecs and baboons, are supposed to exhibit less intelligence, though their mental qualities, as well as their physical structure, closely assimilate them to the real apes: the old males become morose, sullen, and mischievous.'

From the anatomical details above noticed it appears that so far from there being any ground for separating the *Kahau* [NASALIS] and the *Douc* [PYGATHRIX] from the genus *Sem-*

nopithecus, the organization of those species shows that they undoubtedly belong to it. Mr. Ogilby, in the work above quoted, differs from the views of Dr. Horsfield and Mr. Vigors regarding *Nasalis recurvus*, and gives his reasons for coming to the conclusion that the distinction is really sexual instead of specific. Buffon, Geoffroy, St. Hilaire, and Lesson thought that the Douc had no callosities, and so it is stated in the article PYGATHRIX; but it has callosities, though they are diminutive, and the mistake probably arose from the early descriptions being taken from imperfect skins. M. Rey, the captain of a French merchant-ship, who penetrated some distance into the interior of Cochin-China, gives a description of an encounter with this species. His visit must have been a terrible one for the poor *Doucs*, a hundred of which were killed by his party before they reached the place where they breakfasted. He succeeded with great difficulty in procuring living specimens to carry to France. The more the victims dropped, the more their companions gathered round them, endeavouring to carry off the killed as well as the wounded into the woods. The three young ones that were captured held so fast round the bodies of their dams, that it required no small effort to detach them. M. Rey describes the Douc as greatly resembling the orang-utan in its stature and inoffensive manners, and as inhabiting the mountains and the loftiest tree-tops, feeding on fruit; and observes that the similarity of this creature to man is very mortifying. Some of the males measured, when standing upright, above four feet four inches in height. They were known in the country by the name of *Venan*, or men of the woods.

We now proceed to lay before our readers illustrations of this genus.

Semnopithecus Maurus.



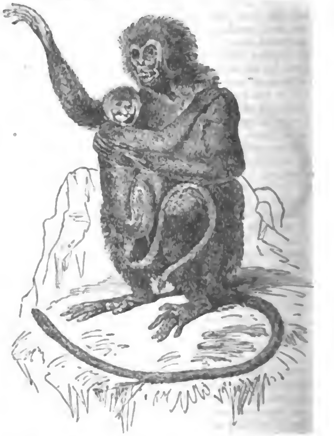
Skull and canine tooth of Semnopithecus Maurus (Horsf.).

Description.—Dr. Horsfield describes this species as being on the whole of a stouter make than *S. melalophos*, and as having more robust extremities. One of the specimens in the museum at the India House measures 2 feet 3 inches from the tip of the nose to the root of the tail. The face is regularly circumscribed by hairs, which are long, and closely applied to the head; the forehead, which is gradually sloping, is entirely concealed by them. The general facial character is a flatness above, and a protrusion of the maxillæ; but the appearance of the face differs greatly in old and young subjects. The maxillæ become extended as the animal advances in age, and in young subjects the facial angle is proportionally greater. The orbits of the eyes are rather prominent, and the bones of the nose short. The nose consists of an angular ridge, which is considerably elevated between the eyes, and terminates, without any fleshy protuberance, by a membrane which is gradually attenuated below, and on each side of which the nostrils are placed. From the termination of the nose to the mouth a considerable space intervenes: the lips are small and thin. The chin is short and small; a circle of grey hairs encloses the mouth in the adult animal; and on the chin the hairs have a disposition downward, so as to exhibit the appearance of a beard. The upper part of the face is nearly naked; a few straggling stiff hairs are scattered on the cheeks and the upper lip, and on the more prominent part of the nose an interrupted series is observed. Irides of the eyes dark brown. Ears concealed from view by the long hairs which cover the lateral parts of the head; they are margined, and both in form and disposition of external parts closely resemble those of man. The neck is short and considerably contracted. The trunk is of great length, broad and robust about the shoulders and the breast, and gradually of smaller dimensions towards the loins. Buttocks with very large rough callosities. Mammæ of the adult female lengthened and cylindrical. Tail as long as the body and head taken together: in some individuals, and particularly in young subjects, it exceeds those parts in length: it is cylindrical for the greatest portion of its length; the base tapers gradually, and the tip is thickened and terminated by a close tuft of long hairs of an ovate form.

Colour of Adult.—Intensely black, except the breast, the abdomen, the inner side of the extremities, and the root of the tail, which are grey. On the crown of the head the black hairs are slightly tipped with grey; and as age advances the grey portion becomes more extensive, and also shows itself on the upper parts of the body; but the extremities externally, and the tail, even in the oldest subjects, retain their blackness. The hairs are remarkably long, delicate, soft, and silky.

Colour of Young.—Immediately after birth, of a fulvous or reddish colour; with advancing age, a grey discolouration first appears on the hands, the forehead, and the tip of the tail; from these parts it gradually extends to the neck, the shoulders, and the flanks, assuming from time to time a darker hue, until the coat of the animal is jet black above and grey beneath. (Horsf.)

This is the *Budeng* of the Javanese; *Lutung itam* 'Maure' of the Malays and Europeans; *Lotong* of the natives of Sumatra.



Semnopithecus Maurus: adult and young. (Horsf.)

Dr. Horsfield states that the *Budeng*, or black species, is much more abundant than the red species, or *Lutung* of the Javanese (*Semnopithecus Pyrrhus*); but the latter, both on account of its variety and comparative beauty, is a favourite among the natives. 'Whenever an individual is obtained,' says Dr. Horsfield, 'care is taken to domesticate it, and it is treated with kindness and attention. The Budeng, on the contrary, is neglected and despised. It requires much patience in any degree to improve the natural sullenness of its temper. In confinement it remains during many months grave and morose; and as it contributes nothing to the amusement of the natives, it is rarely found in the villages or about the dwellings. This does not arise from any aversion on the part of the Javanese to the monkey race: the most common species of the Island, the Cercocebus Aygula of Geoffroy, the Egret Monkey of Pennant, is very generally domesticated; and a favourite custom of the natives is to associate it with the horse. In every stable, from that of a prince to that of a mantry, or chief of a village, one of these monkeys is found; but I never observed the *Budeng* thus distinguished.'

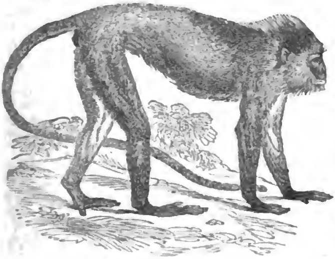
Food; Habits; Utility to Man.—'The *Semnopithecus Maurus*,' continues the author last quoted, 'is found in abundance in the extensive forests of Java; it forms its dwellings on trees, and associates in numerous societies. Troops, consisting of more than fifty individuals, are often found together. In meeting them in the forests it is prudent to observe them at a distance. They emit loud screams on the approach of man, and by the violent bustle and commotion excited by their movements, branches of decaying trees are not unfrequently detached, and precipitated on the spectators. They are often chased by the natives for the purpose of obtaining their fur; in these pursuits, which are generally ordered and attended by the chiefs, the animals are attacked with cudgels and stones, and cruelly destroyed in great numbers. The skins are prepared by a simple process which the natives have acquired from the Europeans, and they conduct it at present with great skill. It affords a fur of a jet black colour, covered with long silky hairs, which is usefully employed, both by the natives and Europeans, in preparing riding equipages and military decorations. The Budeng, during its young state, feeds on tender leaves of plants and trees; and when adult, on wild fruits of every description, which are found in great abundance in the forests which it inhabits.' (*Zoological Researches in Java.*)

Semnopithecus melalophos.

Description.—Brilliant yellow-red above, whitish below; a tuft of black hairs on the forehead in form of a bandeau; face blue.

This is the *Simpai* of the Malays; and in this species the great length of body and slenderness of the extremities so characteristic of the *Semnopitheci* are manifested in the highest degree.

Locality.—The forests of Sumatra.



Semnopithecus melalophos.

Semnopithecus Entellus.

Description.—Young remarkable for the disproportionate length of the extremities, the deliberate air of its movements, and the tranquillity of its eye and physiognomy generally. Face and hands black; body and limbs light grey or straw-colour; hair surrounding the face and forming a projecting bandeau over the eyebrows; a peaked beard directed outwards beneath the chin. The colour always darker on the loins and along the spine, and becoming deeper as the animal advances in age, till finally the fur, becoming mixed with numerous black hairs, is of a rusty brown. The body at the same time becomes more developed and muscular, and the animal, when at its full size, is four feet and a half from the extremity of the muzzle to the origin of the tail, which is considerably longer than the body, of the same colour, and ends in a tuft of hair rather longer and darker than the general hue.

Localities.—Bengal; the Himalayan Mountains; Nepaul; Bootan.

This is the *Hoonuman* (*Houlman* of M. Duvaucel) of the Hindus; *Lungar* of the Hill tribes; and is the monkey which is so remarkably interwoven with the religion of the country where it is found. M. Duvaucel has given an interesting account of the careful watch which the Bengalees kept over him to prevent his killing this sacred animal, holding a high place among the thirty millions of Indian gods, and to save himself from dying within the year, which, according to popular belief, is sure to be the fate of one who puts an Entellus monkey to death. He was harangued by the Hindus upon the danger of injuring animals which were no other than princes and heroes under the operation of the metempsychosis. Unmoved by their eloquence, and eager to possess a specimen, he levelled and brought down a 'princess.' But the acquisition was dearly bought. The ill-fated creature had a young one on her back, and, though shot through the heart, the mother exhausted her remains of life in throwing it into the branches of a neighbouring tree;—then fell and expired at the feet of M. Duvaucel. It is but just to add that he mourned over the deed he had done.

Our limits will not admit of our going further into the interesting connection of this animal with the Hindu mythology. The reader will find much information on this head collected in Mr. Ogilby's book above referred to. M. F. Cuvier has a very characteristic figure of this species in his great work.

Fossil Semnopitheci.

Captain Cautley, in a letter to Dr. Royle, dated Saharumpore, 18th November, 1836, permitted the announcement of a fact which had long been known to the latter, of the finding of the remains of a quadrumanous animal in the Sewaliks or sub-Himalayan range of mountains (tertiary), to the Geological Society of London. An astragalus was first found, but latterly a nearly perfect head with one side of the molars and one orbit nearly complete. It is added that the animal must have been much larger than any existing monkey, and allied to Cuvier's Cynocephaline group. This was communicated to the Society on the 3rd May, 1837. On the 14th June, in the same year, a paper was read 'On the remains of a Fossil Monkey from the tertiary strata of the Sewalik Hills in the north of Hindoostan; by Captain P. T. Cautley, F.G.S., Bengal Artillery; and H. Falconer, M.D., Bengal Medical Service.' The authors commence their paper with some general observations on the differences in habit in various animals, which prevent the remains of some being so frequently preserved as those of others in a fossil state, and they adduce as instances birds and quadrumanous animals. So speedily are the remains of these carried away by the hyæna, the chacal, and wolf, the scavengers of torrid regions, that in India the traces of casualties are so seldom seen, even where monkeys occupy in large societies the groves of mango-trees round villages, that the simple Hindu believes that they bury their dead in the night. The authors were early led to anticipate the finding of some quadrumanous animals among the Sewalik fossils, and, several months from the date of their communication then before the Society, obtained an astragalus of the right leg, which they minutely describe, and compare with that of the recent *Semnopithecus Entellus*, which, though certainly belonging to a distinct species, it closely resembles both in size and general form, as was exemplified in the specimen sent with the fossil astragalus. This was completely mineralized, having a sp. gr. of about 2·8, and appearing to be impregnated with hydrate of iron. Although only a solitary bone of the foot, the relations of structure are so fixed that the identity of this fossil is as certain as if the entire skeleton had been found. But the authors deferred making the announcement, in the hopes of soon finding specimens of the cranium and teeth; these, they add, have been discovered by Messrs. Baker and Durand of the Bengal Engineers, who have obtained a considerable portion of the face, and the whole series of molars of one side of a quadrumanous animal belonging to a much larger species than theirs. (*Geol. Proc.*, vol. ii., 1837-1838.)

SEMPERVIV'UM (' always living,' from *semper* and *vivo*, on account of their tenacity of life), a genus of plants belonging to the natural order Crassulaceæ. This genus is known by possessing a calyx 6- to 12-parted, and occasionally even 20-parted; petals 6 to 12 in number, seldom 20, more or less united at the base; 12 to 24 stamens or more, grown together at the base; scales at the base of the carpels, which are follicular, and equal in number to the petals. The genus is composed mostly of herbs, some of which are stemless, and have young plants growing from the axils. Others are caulescent, without young plants, or they may be shrubby and fleshy. The leaves are usually revolute, and their branches of cymose flowers are disposed in corymbs or panicles. Their flowers are white, yellow, or purple. The species of Sempervivum, like the family to which they belong, have most of them thick fleshy leaves and small roots, and are adapted for growing in rocky, dry, barren places. The arrangement of their leaves is frequently very elegant, and many of the species are cultivated in our greenhouses and gardens. Some are used in the arts and medicine.

Sempervivum glutinosum, Clammy House-leek: stem frutescent; leaves wedge-shaped, viscid, rather scattered, fringed with cartilaginous ciliæ; petals 8 to 10. It is a native of Madeira It has loose panicles of golden yellow flowers, with a stem about two feet high. The fishermen of Madeira are in the habit of using this species to rub their nets, which are however previously steeped in an alkaline solution of some kind. They are said to endure as long as if they were tanned.

S. tectorum, Common House-leek: leaves ciliated; offsets spreading; petals 5 to 9, spreading; scales of flowers wedge-shaped, caruneulate. It was originally a native of alpine and sub-alpine regions of central Europe, but it has now found its way to the tops of old walls and the thatched and tiled roofs of the houses of nearly all the countries of Europe. This species is remarkable for the change its structure undergoes by cultivation. In all the wild examples the flowers possess two rows of stamens and one row of carpels; but in the cultivated examples, one or both rows of stamens are constantly converted into carpels. This was pointed out by Mohl, in 1836, and gave him an opportunity of describing the true nature of the morphosis that takes place in the formation of stamens and pistils. The common house-leek is used, both internally and externally, as a popular remedy for many diseases. Its juice has been given in chronic discharges from the mucous membranes. When mixed with cream, it is applied to burns, and is also said to cure corns. Its general growth on the roofs of houses seems to have arisen from the belief that it had the power of averting the influence of lightning from buildings. On this account it is also sometimes called thunder-plant. Probably the order given by Charlemagne, that it should be planted on all buildings, originated in this belief. It is known by many other names than that of house-leek, as Jupiter's-eye, bullock's-eye, and Jupiter's-beard.

About thirty-six species of this genus are described. Those known in greenhouses are chiefly brought from the Canary Islands. In cultivating them, a mixture of sand, loam, and brick-rubbish is the best soil for them; and care should be taken not to give them much water when not in flower. The hardy kinds may be grown on rock-work, old walls, roofs, &c., and may be conveniently propagated by offsets, which they produce in abundance.

SEMUR-EN-AUXOIS. [CÔTE D'OR.]

SEMUR-EN-BRIONNAIS. [SAÔNE ET LOIRE.]

SENAC, JEAN, was born at Lombez in 1693, and obtained the diploma of Doctor of Medicine at Rheims. He was appointed first physician to the king in 1752, and was a member of the Royal Academy of Sciences of Paris. He died in 1770. The present reputation of Senac is due to his great work on the structure of the heart, its action, and its diseases, which was first published at Paris in 1749, in two quarto volumes, and was afterwards re-edited by Portal, and translated into English and other languages. At the time of its publication, this work was justly regarded as the best anatomical monograph ever written in France; and although recent investigations have detected in it numerous errors, and have deprived it of much of its intrinsic value, it will always remain an admirable monument of the learning and the industry of its author. The other writings of Senac are unimportant; a complete list of them may be found in Haller's 'Bibliotheca Anatomica,' t. ii., p. 159.

SENA'CIA, a small genus of plants of the natural family of Pittosporeæ, named in honour of Jean Senac, a French physician. The species are natives of the West Indies, Mauritius, and of the Himalayas. The genus is characterised by its small 5-toothed calyx. Petals 5. Stamens 5 hypogynous. Younger capsules berry-formed, afterwards 2-valved, half 2-celled. Seeds 4 to 8. The species form smooth-branched shrubs, with feather-veined entire leaves, and terminal corymbs of white flowers. This genus closely resembles Celastrus, but the hypogynous insertion of the stamens is a distinguishing character. The wood of Senacia undulata (the Celestrus undulatus of Lamarck), a native of the Mauritius, is well known and esteemed for its hardness. It is thence called *bois de joli cœur* by the French.

SENA'N, a Sabian physician, astronomer, and mathematician, whose names, as given at full length by Ibn Abi Osaibia (*Oioún al-Ambá fi Tabacát al-Atebbá*, 'Fontes Relationum de Classibus Medicorum,' cap. 10, sec. 4), are *Abou Said Senán Ben Thábet Ben Corrah*. He was born at Harran in Mesopotamia, and his father, his brother, and his son were among the most celebrated physicians of their time. [THABET.] He was physician in ordinary to Moctader and Cáher, the eighteenth and nineteenth of the Abbasside khalifs of Bagdad, who reigned from A.H. 295 to A.H. 322 (A.D. 908-934). By the former of these princes he was advanced to the dignity of the *Rais alai 'l-Atebbá*, 'chief of the physicians,' or 'archiater.' He was also appointed public examiner, A.H. 319 (A.D. 931), and the khalif, in consequence of an ignorant practitioner's having killed one of his patients, ordered that no one for the future should be allowed to practise as a physician, until he had been licensed to do so by Senán.[*] (*Arab. Philosoph. Biblioth.*, apud Casiri, 'Biblioth. Arabico-Hisp. Escur.,' tom. i., p. 437-9.) The anonymous author of this work 'relates,' as Gibbon says, 'a pleasant tale of an ignorant but harmless practitioner,' who presented himself before Senán for a licence to practise; which anecdote is told also with additional circumstances by Abul-Faraj, 'Chron. Syr.,' p. 187; and 'Hist. Dynast.,' p. 197. The khalif Cáher showed his favour to him by wishing him to embrace Islám. This he refused for some time, but was at last terrified by threats into compliance. As however the khalif still continued to behave with great severity towards him, and at the same time transferred his favour to another physician, Isa Ben Yusuf, he fled to Khorasán; he afterwards returned to Bagdad, and died A.H. 331 (A.D. 942). The titles of several of his works are preserved in Casiri (*loco cit.*), relating chiefly to astronomy and geometry. Like his father Thabet, he appears to have written also several works relating to the religious doctrines, rites, and ceremonies of the Sabians; from which, if they could be recovered, we might expect much fuller and more accurate information respecting this curious people than we possess at present.

SENA'TUS, according to the etymological meaning of the word, is 'an assembly of elders,' and this is the sense which the Roman writers attach to the earliest senate of Rome. The number of senators in the Greek republics, as well as at Rome, always bore a certain relation to the number of tribes of which the state was composed. Hence, as long as Attica was divided into four tribes, the number of senators was 400; and when Cleisthenes divided the country into ten tribes, he increased the number of senators to 500. As long as Rome only comprehended one tribe, the Latins of the city on the Palatine, their senate consisted of only 100 members. After the accession of a second tribe, the number of senators was raised to 200; and when a third tribe was united with them, the number of senators was increased to 300. [ROME, p. 105.] Each of the three Roman tribes was divided into ten curiæ, and each curia into ten gentes, and the same number of decuries, containing, according to Göttling, parts of several gentes, and made for purposes of representation. At the head of each gens there was a decurio, who, according to Niebuhr, by virtue of this office was a senator, or a representative of his gens in the senate. But Walter (*Gesch. des Röm. Rechts*, p. 23) justly observes that the age of a decurio, who was at the same time a military officer, and consequently must always have been a young man and able to bear arms, does not appear to be consistent with the age and duties of a senator. It is much more probable that each decury elected from its own body one by whom it was represented in the senate. Each curia was thus represented by ten senators, who were called a 'decuria senatorum' (Liv., i. 7). At the head of this decuria senatorum was a curio, and the ten heads of the decuries, when the senate consisted of only 100 members, or ten decuries, were the 'decem primi,' from among whom the king chose one as princeps senatus. It appears that when the Ramnes and Tities became united, and the senate consisted of twenty decuries, the ten decuries of the Ramnes with their decem primi still retained for a time a kind of superiority over the Tities. (Dionys. Hal., ii., p. 111; Plut., *Num.*, 3.) The senators representing the Ramnes gave their votes first, and the princeps senatus was chosen from among them alone. But the first two tribes must soon have been placed on a footing of equality, so that some of the decem primi, as well as the princeps senatus, might belong to either of the tribes. (Dionys., *l. c.*) After the union of the third tribe, the senators representing the first two are supposed by Niebuhr to be the 'patres majorum gentium,' and those representing the third to be the 'patres minorum gentium.' Göttling (*Gesch. d. Röm. Staatsv.*, p. 227) on the other hand considers the 'patres minorum gentium' to have been the noble plebeians whom Tarquinius Priscus admitted into the three old tribes, and who, in consequence of this, became eligible to the senate. (Cic., *De Rep.*, ii. 20.) The patres minorum gentium had at first, as Niebuhr (ii., p. 114) supposes, no right to speak in the senate, but merely voted by *going over* to either party; and he therefore conceives that they were the 'senatores pedarii.' (Gellius, iii. 18; Dionys., vii., p. 453.) This name of senatores pedarii might in subsequent times, when all the senators had equal rights, be applied to all senators indiscriminately, as it was their general custom to vote by discessio, or a division. All writers agree that Tarquinius Priscus raised the number of senators to 300, but the manner in which this was effected is stated differently. Cicero (*l. c.*) says that the king doubled the existing number of senators (which would accordingly have been 150), while others (Liv., i. 35; Dionys., iii., p. 199) state that he merely added 100 senators to the existing number of 200. Niebuhr (i., p. 401) ingeniously reconciles these two statements by the supposition that before the time of Tarquinius Priscus some of the gentes of the first two tribes had become extinct, though it does not follow that the number of the extinct gentes amounted exactly to fifty. But if, as we have supposed, the senators were not elected by each gens, but by a decuria, Niebuhr's supposition must fall to the ground, as it cannot be conceived how decuries could become extinct, as they might be formed in such a manner that one large gens would comprehend several decuries, while smaller ones united in forming one decury, and thus were always able to make up a certain number of decuries. The statement of Cicero appears to rest upon a misconception. (Göttling, p. 228.) Servius Tullius did not introduce any change in the composition of the senate, but in the reign of the last king, Tarquinius Superbus, the number of senators is said to have become greatly diminished, as many of them were put to death, and others were sent into exile. These vacancies however were filled up immediately after the establishment of the republic by electing into the senate the principal plebeians of the equestrian order. Livy (ii. 1) ascribes this completion to L. Junius Brutus; Dionysius (v., p. 287), Plutarch (*Popl.*, 11), and Festus (*s. v.* 'qui patres'), to Valerius Publicola. The number of these new plebeian senators is said to have been 164, but this is utterly incompatible with the subsequent history of Rome. The new plebeian senators were called Conscripti, in contradistinction to the patrician senators, or patres; hence the mode of addressing the whole senate 'patres conscripti,' that is, 'patres et conscripti.' The word patres, although in later times used to designate senators in general, was originally another name for patricians. (Liv., ii. 1; Fest., *s. v.* 'adlecti;' Niebuhr, i., p. 327, &c.) The number of 300 senators henceforth remained unaltered for several centuries. C. Gracchus was the first who attempted an alteration. Livy (*Epit.*, lib. 60) says that he wished to increase the senate by adding 600 equites, but this seems a mistake, and the reading is probably corrupt. Plutarch (*C. Gracch.*, 5, &c.) says that he added 300 equites to the 300 senators, and transferred to this body the Judicia (publica). All the other writers who mention these events (see the passages in Göttling, p. 237, note 3) do not allude to an increase in the number of senators, but merely state that he transferred the Judicia to the equites. A similar attempt was made by the tribune Livius Drusus. (Appian, *Civil.*, i. 35.) Sulla added 300 equites to the senate, and thus increased its number to 600. [SULLA.] Four hundred senators were after this time present in a case when many were absent. (Cic. *ad Att.*, i. 14.) J. Cæsar increased the number of senators to 900, and elected men of the lowest rank into the senate. (Dion Cass., liii. 47.) This mode of filling up vacancies or increasing the number of senators with freedmen and common soldiers was continued after the death of Cæsar, and at one time there were more than 1000 senators. (Suet., *Aug.*, 35.) Augustus again reduced the number to 600. (Dion Cass., liv. 14.) Respecting the number of senators during the empire, we possess no direct information. During the latter period of the empire the number of senators appears to have become greatly diminished.

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[*] The number of persons in Bagdad who underwent this examination is said to have amounted to eight hundred and thirty.

The senators were from the earliest times elected for life. Their name indicates that originally they were men of advanced age, but the exact age at which a man might become a senator during the kingly period is not mentioned. During the latter centuries of the republic however the age seems to have been fixed by some Lex Annalis, as the ætas senatoria is frequently mentioned. But as a quæstor after the year of his office might be made a senator, and as the legitimate age for the quæstorship was twenty-five years, we have reason to believe that a person who had attained the age of twenty-six might be elected a senator. It might however be inferred from Polybius (vi. 17) that this was not the case till a person had completed his twenty-seventh year. As regards the election of persons into the senate during the kingly period, Livy (i. 8) and Festus (*s. v.* 'Præteriti Senatores') state that it was a privilege of the kings. Dionysius (ii., p. 85), though he involves himself in difficulties by supposing that the three tribes were already united when the senate consisted of only 100 members, is undoubtedly right in stating that the senators were not appointed by the kings. (Niebuhr, i., p. 338.) The senators were elected by the decuries, and thus were real representatives of the curies, or a select body of the populus. The plebeians, who were afterwards admitted into the senate by Tarquinius Priscus, and after the banishment of the kings, must either have been incorporated with the patrician gentes, or their number must have been very small, for the first instance of a plebeian senator at Rome is Sp. Maelius, in 439 B.C.; and a second is P. Licinius Calvus, in 400 B.C., although the latter may have held the office of quæstor, and so have got admission into the senate. Niebuhr (i., p. 527, &c.) thinks that long before the institution of the censorship there must have been a time when the senators were chosen by the curies, and not by the subdivisions of the curies, and that each curia elected ten senators. He founds this supposition upon the Lex ovinia tribunicia mentioned by Festus (*s. v.* 'Præteriti Senatores'). But as regards the time, Niebuhr is manifestly wrong, which he himself seems to have felt afterwards (ii., p. 403, note 885); for the Lex Ovinia refers to the censors, whom it directed to elect into the senate 'optimum quemque curiatim.' (Compare Göttling, p. 345, &c.; Walter, *Gesch. d. Röm. R.*, p. 100, &c.) During the early period of the republic, the right of electing persons into the senate belonged to the consuls, dictator, and military tribunes. But all the curule magistracies, as well as the quæstorship, conferred upon those persons who had held them the right of being elected into the senate. (Liv., xxii. 49, 'unde in Senatum legi deberent.') The quæstorship conferred this right probably from the earliest times, as it did in the time of Sulla [QUÆSTOR], and this circumstance explains why the patricians opposed the eligibility of the plebeians to the quæstorship. After the establishment of the censorship, the election of persons into the senate was wholly in the hands of the censors. All curule magistrates, that is, consuls, prætors, curule ædiles, and censors, had by virtue of their office a seat in the senate, and might speak on any subject. After their office was over they retained this right, but without being real senators. Now vacancies in the senate were filled up at every lustrum, and it was only on this occasion that the censors might elect those ex-magistrates into the senate whose conduct was unblemished. Hence we have to distinguish between two kinds of senators, real senators (senatores), and such as were allowed 'dicere sententiam in senatu.' (Fest., *s. v.* 'Senatores.') The old decem primi senatus are no longer mentioned. The honour of princeps senatus, which during the kingly period had been combined with the office of custos urbis, and had been granted by the kings for life, was afterwards united with the office of prætor urbanus, or with that of a military tribune (Liv., vi. 6), and only lasted for one year. After the establishment of the censorship, this honour was conferred by the censors, and at first upon the eldest among the living ex-censors; but afterwards upon any one whom the censors thought most worthy. (Liv., xxvii. 11.) If the censors thought a person who had held a curule office unworthy of being a senator, they passed over him ('præteribant:' Fest., *s. v.* 'Præteriti'); but this seems to have seldom occurred with persons who had held a curule office. (Liv., xxxiv. 44; xxxviii. 28.) The plebeians as an order never obtained the right of being eligible as senators; but as soon as the great offices of the republic became accessible to the plebeians, their claims to the dignity of senator could not be disputed. As therefore the quæstorship, consulship, censorship, and prætorship, were one after the other thrown open to the plebeians, their numbers in the senate likewise continued to increase. At last (perhaps in the year 131 B.C.; Walter, p. 165, note 156), even the tribunes of the people, after having before acquired the right to convoke the senate and to take part in its deliberations, gained by the Plebiscitum Atinium the rights of real senators. (Gellius, xiv. 8.) On certain occasions a dictator was created for the purpose of electing new members into the senate. (Liv., xxiii. 22, &c.) M. Fabius Buteo, in 216 B.C., not only elected such men as had held curule offices, but also such as had been plebeian ædiles, tribunes, quæstors, and persons who had distinguished themselves as soldiers. The senate, which at first had been the representative of the populus, thus gradually became the real representative of the people; for although the censors or a dictator were the electors, yet, either by custom or by law, they always elected such men as had held offices given by the people, so that it was in fact the people who elected the members of the senate, and the Roman senators themselves viewed their dignity as from the people. (Cic. *pro Sext.*, 65; *c. Verr.*, iv. 11; *pro Cluent.*, 56.) This also accounts for the fact that the members of the great colleges of priests, with the exception of the flamen dialis (Liv., xxvii. 8), had no seats in the senate; and for the same reason it was a disputed point whether the præfectus urbi should have a vote in the senate (Gellius, xiv. 8), for in the colleges of priests vacancies were filled up by co-optatio of the members themselves, and the præfectus urbi was appointed by the consuls, and none of them derived their power from the people. In the time of Cicero however this appears to have been altered, for we find that pontiffs might at the same time be senators. (Cic. *ad. Att.*, iv. 2.) Notwithstanding all this however, the senate, down to the end of the republic, preserved in a great measure its original character; it remained an aristocratic body.

During the republic we do not hear that any property qualification was required for a senator (Plin., *Hist. Nat.*, xiv. 1), though the senators must generally have belonged to the wealthiest classes. There is indeed a passage in Livy (xxiv. 11) from which it has been inferred that previous to the second Punic war a senatorial census was instituted (Niebuhr, iii., p. 406); but the words of Livy are too vague to admit of such an inference, and probably refer only to the fact that senators were among the wealthiest Romans, and were consequently able to make greater sacrifices to the republic than other persons. Göttling (p. 346) concludes from Cicero (*Ad Fam.*, xiii. 5) that Cæsar was the first who instituted a senatorial census, but the passage of Cicero is even less conclusive than that of Livy. The first to whom the introduction of a senatorial census is expressly ascribed is Augustus. He first fixed it at 400,000 sesterces, but afterwards increased it to 800,000, and at last to 1,200,000 sesterces. (Suet., *Aug.*, 41; Dion Cass., liv. 17, 26, 30; lv. 13.) If a senator lost or spent so much of his property as to fall short of the senatorial census, he was obliged to withdraw from the senate, unless the emperor connived, or supplied the deficiency. (Tacit., *Annal.*, ii. 48; xii. 52; xv. 28; *Hist.*, iv. 42; Suet., *Aug.*, 41; *Tiber.*, 47; Dion Cass., lx. 11.) The senatorial age was fixed by Augustus at twenty-five years (Dion Cass., lii. 20), and the names of the senators were entered on a list called 'Album Senatorium.' (Tacit., *Annal.*, iv. 42; Dion Cass., liv. 13; lv. 3.) Augustus reduced, as we have seen, the number of senators to 600, and cleared their body from the unworthy persons who had been admitted before his time. He also improved the senate by electing into it the most distinguished citizens of municipia and colonies, and even provincials. (Tacit., *Annal.*, iii. 55; xi. 25; Suet., *Vespas.*, 9.) Such senators of course resided at Rome, and, with the exception of those who belonged to Sicily or Gallia Narbonnensis, they were not allowed to visit their former homes without a special permission of the emperor. (Tacit., *Annal.*, xii. 23; Dion Cass., lii. 42; lx. 25.) At a later period these foreign senators were required to purchase a certain amount of landed property in Italy. (Plin., *Epist.*, vi. 19.) The emperors also assumed the right of convoking the regular as well as extraordinary meetings of the senate (Dion Cass., liii. 1; liv. 3), although the consuls, prætors, and tribunes continued to enjoy the same privilege. (Tacit., *Hist.*, iv. 39; Dion Cass., lvi. 47; lix. 24.)

Senators were never allowed to carry on any mercantile business. About the commencement of the second Punic war however, some senators seem to have entered into mercantile speculations; and a law was passed, notwithstanding the opposition of the senate, that no senator should be allowed to possess a ship of more than 300 amphoræ in tonnage (Liv., xxi. 63), this being thought sufficiently large to convey to Rome the produce of their possessions abroad (comp. Cic. *c. Verr.*, v. 18); from which passage it is clear that this law was not always observed. No one moreover could be elected senator whose parents were not free men by birth (ingenui). The first violation of this custom was attempted by the censor Appius Claudius Caecus, who elected into the senate the sons of freedmen. (Liv., ix. 29 and 46; Aurel. Vict., *De Vir. Illustr.*, 34.) But this election was considered illegal. Towards the close of the republic such proceedings appear to have been rather common. (Dion Cass., xl. 63; iii. 47; Horat., *Sat.*, i. 6, 21.) If a senator was struck from the lists of senators by the censors, he was not disqualified for any of the great state offices, but he might still obtain them, and thus find his way back to the senate. (Cic. *pro Cluent.*, 46; Dion Cass., xxxviii. 30; xliii. 52; comp. 'Nota' in *Dict. of Greek and Rom. Antiq.*)

The regular meetings of the senate (*senatus legitimus*) during the republic were held on the calends, nones, and ides of every month. (Cic. *ad Quint. Frat.*, ii. 13.) Extraordinary meetings (*senatus indictus* or *edictus*) might be convoked on any day, provided it was not a dies comitialis or a dies ater. Augustus decreed that a senatus legitimus should only be held twice every month, on the calends and on the ides; that during the months of September and October, only a small number of senators, drawn by lot, should attend; and that their attendance should be sufficient to enable the body to transact business. (Suet., *Aug.*, 35; Dion Cass., lv. 3.) What number of senators was necessary in order to constitute a legal meeting is uncertain: on some occasions however, as we see from the senatus consultum de Bacchanalibus (Liv., xxxix. 18), a decree could not be made unless there were one hundred senators present. Sometimes also it was found necessary to enforce the attendance by a multa, or a pignoris captio. (Cic., *Philip.*, i. 5.) Augustus increased the severity of the law in this respect. (Dion Cass., liv. 18; lv. 3; lx. 11.) At first he required the presence of four hundred members to constitute a full assembly; but he afterwards reduced this number; and at a later period, the presence of seventy, or even fewer senators, was sufficient. (Lamprid., *Alex. Sev.*, 16.)

The places of meeting for the senate (curiæ or senacula) were always templa, *i.e.* places consecrated by the augurs; and there were originally three of them: 1, the temple of Concordia, between the Capitol and the Forum; 2, a place near the Porta Capena; and 3, a place near the temple of Bellona, outside of the city. (Fest., *s. v.* 'Senacula.') Subsequently however meetings of the senate were held in a great many other places. The place near the temple of Bellona was principally used for the purpose of giving audience to generals who returned from their campaigns, and were desirous to obtain a triumph: also to receive foreign ambassadors, especially such as were sent by an enemy, and were not allowed to enter the city. Towards the close of the republic, it was decreed that during the whole month of February the senate should give audience to foreign ambassadors on all days on which a senate could be held, and that no other business should be transacted in the senate until the affairs of the foreign ambassadors were settled. (Cic. *ad Quint. Frat.*, ii. 13; *ad Fam.*, i. 4.)

In the earliest times of Rome, the right of convoking the senate belonged to the kings or their vicegerents, and they also introduced the subjects for discussion. The princeps senatus, or custos urbis, put the question. The patres majorum gentium voted first, and the patres minorum gentium last. (Cic., *De Rep.*, ii. 20.) During the republic the senate might be convoked by the consuls, the dictator, the prætor, the tribunes of the people, the interrex, or the præfectus urbi: the decemvirs, military tribunes, and the triumviri rei publicæ constituendæ, likewise exercised this right; but the persons who intended to convoke the senate generally offered sacrifices to the gods and consulted the auspices. (Gellius, xiv. 7.) The assembled senators appear to have sat in a regular and fixed order: first, the Princeps senatus; then the Consulares, Censorii, Prætorii, Ædilicii, Tribunicii; and lastly, the Quæstorii. In this succession they also gave their votes. (Cic., *Philip.*, v. 17; xiii. 14; *ad Att.*, xii. 21.) The majority always decided. This mode of voting remained the same during the empire. (Plin., *Epist.*, viii. 14; ix. 13; Tacit., *Annal.*, iii. 22; xi. 5.) The business was conducted as follows: the magistrate who had convoked the senate was always the president, and he laid before the assembly the subjects for discussion, opening the business with the words, 'Quod bonum, faustum, felix, fortunatum sit; referimus ad vos, patres conscripti.' After the subject of discussion was explained, the president asked the senators for their opinion in the order in which they sat. (Liv., i. 32; ix. 8.) If the consules designati were present, they had the precedence even of the princeps senatus. (Sallust., *Cat.*, 50; Cic., *Philip.*, v. 13.) If any of the members dissented from the measure proposed, he might express his opinion freely, or propose an amendment to it. After the discussions were over, the president called upon the members to vote; and the majority, which decided the question, was ascertained either by numeratio or discessio. A sitting of the senate was, generally speaking, not continued after sun-set; but in unexpected or very urgent cases the business was carried on by candle-light, and even till after midnight. Augustus introduced the custom that every senator, before he took his seat, should offer incense and a libation to the god in whose temple the meeting was held. (Suet., *Aug.*, 35.) During the time of the empire one of the consuls seems always to have presided in the senate, and the emperors only when they were consuls (Plin., *Epist.*, ii. 11); but by virtue of their tribunician power, they might at any session introduce any subject they pleased (Dion Cass., liii. 32), and subsequently this privilege was granted to them by an especial decree (jus relationis). (Vopisc., *Prob.*, 12; J. Capitol., *Pertin.*, 5; *M. Antonin.*, 6; Lamprid., *Alex. Sev.*, 1.) The measures or propositions made by an emperor were introduced in the form of written orations (orationes principum), and read in the senate by one of his quæstors. (Suet., *Aug.*, 65; *Tit.*, 6; Tacit., *Annal.*, xvi. 27.) The manner of conducting the business was on the whole the same as in the time of the republic. But when magistrates were elected in the senate, the votes were given by ballot. (Plin., *Epist.*, iii. 20; xi. 5.) Previous to the time of Cæsar the transactions of the senate were not kept or preserved in any regular way. (Plut., *Cat. Min.*, 23.) Cæsar was the first who ordained that all the transactions of the senate (acta senatus) should be kept and made public. (Suet., *Cæs.*, 20.) These transactions were written under the superintendence of one of the senators (called 'ab actis,' or 'à cura actorum'), by scribes appointed for the purpose. (Tacit., *Annal.*, v. 4, &c.; Spart., *Hadr.*, 3.) In case the business of the senate was carried on in secret, the senators themselves officiated as clerks. (Jul. Capitol., *Gord.*, 12.)

Down to the end of the republic the senate of Rome partook more or less of the character of a body representing the people: it was, as Dionysius says (v., p. 331; vi., p. 408), the head and soul of the whole republic, or the concentrated intelligence and wisdom of the whole nation. It is chiefly to the consistency, wisdom, and energy with which the senate acted during a long period that Rome was indebted for her greatness and her success.

During the kingly period the kings acted according to the determinations of the senate, and the kings had only the executive. The subjects on which the senate decided before they came before the people, comprehended the whole internal administration of the state, legislation, finance, and war. On the death of a king the senate proposed the new candidate to the comitia by means of the interrex. (Liv., i. 17.) At the establishment of the republic no change appears to have been made in the power and authority of the senate. The senate and the people had the sovereign power. At first all measures, whether relating to the administration or legislation, originated with and were prepared by the senate; but this power was afterwards considerably diminished by the attacks of the tribunes of the people. In many cases the original state of things became reversed, inasmuch as laws might originate with the people, and only require the sanction of the senate; or might have the power of laws even without this sanction. [Rome, p. 106; Tribunus.] A still more formidable blow was inflicted upon the power of the senate when the tribunes obtained the right of invalidating its acts by their intercessio. [Tribunus.] The power which the senate exercised during the republic, when the tribunes did not intercede, may be comprised under the following heads:—

1. The senate had the control of the public treasury (aerarium) (Polyb., vi. 13); the accounts of all the revenues were laid before the senate, and no part of the public money could be expended without their consent. Hence no consul or magistrate could raise an army, or keep it at the expense of the state, unless he was authorised by the senate. [Scipio, p. 79.]

2. Crimes committed in Italy, such as treason, conspiracies, poisoning, and murder, belonged to the cognizance of the senate; moreover, if any private individuals or any of the allied towns of Italy had disputes among themselves, if they had done anything deserving punishment, or if they required assistance or a garrison, all this was within the power of the senate. (Polyb., vi. 11; comp. Liv., xxx. 26.) In cases however where a judicial sentence was required, the senate appointed a person, but did not pronounce sentence itself. (Cic., *De Off.*, i. 10; Val. Max., vii. 3, 4.)

3. All ambassadors sent from Rome, and all commissioners charged with the regulation of the affairs of a newly conquered province, were nominated by the senate, and the ambassadors themselves were in many cases members of the senate. All foreign ambassadors communicated with the Roman senate. (Polyb., *l. c.*; and Livy, in numerous passages.) Treaties concluded with foreign nations by a Roman general required the sanction of the senate.

4. The senate assigned to the consuls and prætors their respective provinces [Provincia], and the senate might at the end of a year propose the prolongation of their imperium.

5. The senate decreed all public thanksgivings (supplicationes) for victories obtained by the generals of the republic; and the senate alone could confer on a victorious general the honour of a triumph or of an ovatio. (Liv., v. 23; Cic., *Philip.*, xiv. 5.)

6. The senate in times of great danger could delegate unlimited power to the consuls; and this was done by the formula, 'videant consules nequid respublica detrimenti capiat.' The senate had also the supreme superintendence in all matters of religion, and decided whether the worship of new gods was to be adopted or not. [Serapis.]

During the empire the senate lost its former character, for the emperors became the sovereign, and the senate was a subordinate power, and little more than a high court of justice. [Rome, p. 110.] Respecting the provinces of the senate, see Provincia, p. 64. The senators however were always looked upon as persons of the highest rank. Vacancies were filled by the emperor at discretion, chiefly with equites, whence the equites are called seminarium senatus. (Lamprid., *Alex. Sev.*, 19; Joseph., *Antiq. Jud.*, xix. 1.) Constantine established a second senate at Byzantium, and the emperor Julian conferred upon it the privileges which were enjoyed by the senators of Rome. (Zosimus, iii. 11.) Both senates were still sometimes addressed by the emperors in an imperial oration concerning matters of legislation, and each of the senates still continued to be a high court of justice, to which the emperors referred important criminal cases. The senatorial dignity was now obtained either by descent, by the favour of the emperor, or by virtue of having held some office at the imperial court. The senators enjoyed many distinctions, but their burdens were exceedingly heavy, for they had to pay a peculiar tax (follis) upon their landed property, to give public games, and magnificent presents to the emperors, and, in times of need, large donations to the people. The emperors therefore contrived to elect into the senate the wealthiest persons from all parts of the empire. (Walter, *Gesch. d. Röm. Rechts*, p. 367, &c.)

From the time of Diocletian the senate was only a shadow of its former state, but it was still the highest object of the ambition of the wealthy Romans.

It now remains to mention some of the external insignia and the privileges of the Roman senators.

1. The *latus clavus*, or *tunica laticlavia*, or a tunica with a broad purple stripe, which was not sewed to it, but woven in it.

2. A kind of short boots with the letter C on the top of the foot. This C is generally interpreted to mean centum, and to refer to the original number of hundred (centum) senators.

3. A particular place (orchestra) in the theatres and amphitheatres. This was first assigned to the senate by Scipio Africanus Major, B.C. 194 (Liv., xxxiv. 54; comp. Cic. *pro Cluent.*, 47.) In the reign of Claudius they obtained the same distinction at the games in the Circus. (Suet., *Claud.*, 21; Dion Cass., lx. 7.)

4. On the day when sacrifices were offered to Jupiter, the senators had a public feast on the Capitol, and this distinction, which no one else had, was called jus publice epulandi. (Suet., *Aug.*, 35; Gellius, xii. 8.)

5. The jus liberæ legationis, that is, senators, when allowed to travel abroad, had a right to demand from the inhabitants of the towns or countries through which they travelled, all that was necessary for their support or accommodation. Towards the end of the republic this right was much abused, wherefore Cicero obtained the passing a law which limited the time during which a senator might be absent and enjoy the jus liberæ legationis to one year: Cæsar however extended it to five. (*Dict. of Greek and Rom. Ant.*, under 'Legatus.')

SENATUS CONSULTUM. [ROME, p. 117.]

SE'NECA, LUCIUS ANNÆUS, was probably born a few years before the Christian æra, at Cordoba in Spain, and was brought to Rome while quite a child for the prosecution of his studies and for his health. (*Con. ad Helv.*, 16.) He was the second son of Marcus Annæus Seneca, the rhetorician, and the author of 'Suasoriæ, Controversiæ, Declamationumque Excerpta,' whose memory was so strong that he could repeat two thousand words in the same order as he heard them. He had the reputation of being a man of taste, but when we consider that his taste was so comprehensive as to admit a hundred to the rank of orators in a century whose orators fame limits to five or six, we may reasonably doubt its value and delicacy. As was natural with such a man, he assiduously directed the studies of his son to rhetoric, a preference which Lucius soon rebelled against, and, placing himself under Papirius Fabianus, Attalus, and Sotion, devoted himself to philosophy. In common with many others who aspired to wisdom, young Seneca travelled into Greece and Egypt, and in his 'Quæstiones Naturales' (a remarkable work, which shows him to have been master of the scientific knowledge of his time), he has judicious and accurate remarks on Egypt and on the Nile. But his father at length succeeded in convincing him that worldly interests ought not to be sacrificed to philosophy, and he undertook the business of an advocate. He became quæstor, and under the emperor Claudius rose to distinction; but the particulars of his life are at this period nowhere traceable with any degree of certainty, and we must therefore suspend our judgment as to the truth of Messalina's accusation against him of adultery with Julia, daughter of Germanicus. (Tacit., *Ann.*, xiii. 42.) His intimacy and connection with her were certainly very equivocal, and the manners of the time still more so; but then Messalina, who was humbled by the pride of the princess, and who nowhere manifested any nice sense of right and wrong, is not worthy of much credit. The result however was Julia's exile and subsequent assassination, and Seneca's banishment to Corsica. Here, according to his account, he spent his time in the study of philosophy, and writing his treatise on 'Consolation.' This stoicism looks very well on paper, but, unfortunately for his credit, we find him courting the emperor in a servile strain of adulation, and begging to be restored to favour.

On the death of Messalina Claudius married Agrippina, who prevailed on him to recal Seneca, and to bestow on him the office of prætor (Tacit., *Ann.*, xii. 8), and she afterwards made him, with Afranius Burrhus, tutor to her son Nero. To Seneca's lot fell the instructing of the young prince in the principles of philosophy and the precepts of wisdom and virtue: with what success all the world knows. In fact an impartial scrutiny of the events of that period, and of Seneca's connection with Nero, leads to the probable conclusion of his being a pander to Nero's worst vices. Not to repeat the many stories current at Rome of his particular acts (which if not fully attested, are yet equally so with those of his virtue and decorum), we will only insist on his immense wealth, and demand whether Nero was a man likely to have bestowed such munificent presents (avaricious as he was known to be) upon one who had no other claim upon him than the instruction of precepts and axioms which he must have laughed at in supreme contempt? Juvenal speaks of 'the gardens of the wealthy Seneca.' He possessed, besides these gardens and country villas, a superb palace in Rome, sumptuously furnished, containing five hundred cedar-tables with feet of ivory, and of exquisite workmanship. His hard cash amounted to 300,000 sestertia, or two millions four hundred and twenty-one thousand eight hundred and seventy pounds sterling of our money; a sum, the magnitude of which might well excite the sarcastic inquiry of Suilius, by what wisdom or precepts of philosophy Seneca had been enabled in the short space of four years to accumulate it? (Tacit., xiii. 42, &c.) We will not affirm with his enemies that he instigated or abetted Nero in the murder of his mother, though we know that Seneca became the foe of his former protectress.

Seneca however soon found that the tyrant who had made such singular use of his precepts, and whose vices had so enriched his philosophical abode, had cast jealous eyes upon this very wealth. He therefore with consummate address offered to refund the immense treasures which he had accumulated, and begged permission to retire on a small competency. Nero would not accept this. Seneca then shut himself up, 'kept no more levees, declined the usual civilities which had been paid to him, and under pretence of indisposition avoided appearing in public.' (Tacit., *Ann.*, xiv. 53, &c.) Nero now attempted to poison him by means of Cleonicus, but he failed in the attempt. Shortly after Antonius Natalis, when on his trial for his share in the conspiracy of Piso, mentioned Seneca as one of the conspirators. All Seneca's biographers loudly deny this. Wishing to keep their Stoic free from the slightest taint, they adopt the most absurd conjectures, assert the most puerile motives, and suppose anything and everything that could clear him of the charge. One says Natalis wished to curry favour with Nero by implicating Seneca. But was Nero a man to need such roundabout measures? Another confidently asserts (upon a 'perhaps' of Brucker) that Nero himself instigated the charge. Upon what authority is this said? These are the most reasonable of the suppositions. We dissent from them all, and we dissent from every judgment of Seneca that we have hitherto seen. Seneca, by confession of every authority, dreaded Nero, had cause to dread him, and therefore even to save his life from impending danger would have strong reason for joining the conspiracy. Piso and Seneca were intimate friends. Natalis had said that he had been sent by Piso to visit Seneca during his illness, and to complain of his having refused to see Piso, and that Seneca, in reply, had said that frequent conversations could be of no service to either party, but that he considered his own safety as involved in that of Piso. (Tacit., *Ann.*, xv. 60.) Granius Sylvanus, tribune of the prætorian cohort, was sent to ask Seneca whether he recollected what passed between Natalis and himself. Sylvanus proceeded to his country-house near Rome, to which Seneca had either accidentally or purposely (Tacitus does not decide which) returned from Campania on that day; and he there delivered his message. Seneca replied, that he had received a complaint from Piso of his having refused to see him, and that the state of his health, which required repose, had been his apology. He added that he saw no reason why he should prefer the safety of another person to his own. We do not see in Seneca's life anything contradictory to the supposition of his being implicated in any conspiracy whatever: certainly not in one against Nero.

Nero, satisfied of his treason, ordered him to put himself to death. He bore this fate with Stoic fortitude, and opened a vein in each arm. His advanced age however caused the blood to flow so slowly that it was found necessary to open also the veins in his legs. This still not succeeding, Statius Annæus gave him a dose of poison, but, owing to the feeble state of his vital powers, it produced little effect. He then ordered his attendants to carry him to a warm bath, and, plunging into it, he was speedily suffocated. His wife Paulina is asserted by his biographers to have 'refused every consolation except that of dying with her husband, and earnestly solicited the friendly hand of the executioner.' Dion Cassius asserts that Paulina, who was considerably younger, was forced to have her veins opened owing to the stoical exhortations of her husband, and to fulfil her frequent promise of never surviving him. Tacitus says (xv. 63) that her veins were opened in compliance with her own wish, and that the blood was stopped by her attendants at the command of Nero; he adds that it is doubtful whether she was conscious of her veins being tied up.

The death of Seneca has been loudly applauded—has sometimes been called sublime; but this is owing to an ignorance of the time and inattention to Seneca's own doctrines. With the Stoics death is nothing ('mors est non esse,' *Ep.*, liv.); it is not an evil, but the absence of all evil ('mors adeò extra omne malum est, ut sit extra omnem malorum metum,' *Ep.*, xxx.). There is nothing after death—death itself is nothing:

'Post mortem nihil est, ipsaque mors nihil.' (*Troades*, act i.)

With such a doctrine there could be no fear of death, and consequently we find that courage to die was common in Seneca's time. 'At that period of languor and luxury,' remarks M. Nisard, 'of monstrous effeminacies, of appetites to which the world could scarcely suffice, of perfumed baths, of easy and disorderly intrigues, there were daily men of all ranks, of all fortunes, of all ages, who released themselves from their evils by death. How was it possible for them to avoid suicide, with no other consolation than the philosophy of Seneca and his theories on the delights of poverty? Marcellinus (Senec., *Ep.*, lxxvii.) is attacked with a painful but curable malady; he is young, rich, has slaves, friends, everything to make life pleasant—no matter, he conceives the fancy of the pleasure of dying. He assembles his friends; he consults them, as if he were going to marry. He discusses with them his project of suicide, and puts it to the vote; some advise him to do as he pleases; but a Stoic, a friend of Seneca's then present, exhorts him bravely to die; his principal reason is that he is *ennuyé*—no one contradicts the Stoic. He thanks his friends and distributes money to his slaves. He abstains for three days from all food, and is then carried into a warm bath, where he quickly dies, having muttered some words on the pleasure he felt at feeling himself dying. And this pleasure was so little of an affectation, so much had it become the fashion, that some of the austere Stoics thought themselves bound to place certain restrictions on it.' (*Etudes sur les Poètes Latins*, i., p. 95.) And further on, 'They committed suicide from *ennui*, from idleness, from want of patience to cure themselves of their ills, for distraction, much in the same way as they killed each other in duel under Cardinal Richelieu.' This throws quite another light on the transaction. In fact his death was like his writings, pompous, inflated, epigrammatic, and striking to common judgments, but bearing no inspection. His terse aphoristic style has rendered him one of the most frequently quoted authors of antiquity, and it was Scaliger, we believe, who remarked that he did more honour to the works of others than to his own.

Besides his 'Physical Questions,' 'Epistles,' and various moral treatises, he is the supposed author of ten tragedies. On this matter however there is much dispute, some declaring these tragedies to be the composition of five or six Senecas. But Quintilian, whose authority is superior to every other on the matter, speaks of Seneca without surname or qualification, and in quoting a verse from the *Medea*, cites it as a verse of Seneca, and not of *one* of the Senecas. (*Instit. Orat.*, ix. 2.) Further, Quintilian, in his list of the Roman poets (x. 1) (in which each name is accompanied by a distinguishing epithet), makes no mention of any author of these ten tragedies; but he says of Seneca, that he wrote orations, poems, epistles, and dialogues, thus appearing to include the tragedies under the term poems. The argument drawn from Seneca's own silence respecting them, or respecting any poetry of his whatever, is but negative, and is nullified by Tacitus, who distinctly asserts him to have written verses ever since Nero had taken to write them. (*Ann.*, xiv. 52.) But apart from these historical evidences, we believe internal evidence to be quite sufficient to convince the most sceptical—evidence not only of style and epigram, but of uniform coincidence in thought and expression.

Of the intrinsic merit of these tragedies there is as much difference of opinion as of their authorship. They have been lauded by commentators and abused by critics. They have been judged from a false point of view. They have been considered as imitations of the Greek dramas, and have been considered as dramas. Both these points of view are erroneous. They were never written for representation, but for reading aloud. This simple fact overturns all criticisms. Not being intended for the stage, any dramatic objection must be unfounded; nor could they for the same reason have been imitations of the Greek, which were written for representation. The proof of this fact is to be seen in the history of the Roman drama and literature by any one who looks attentively, and is to be seen also by a scrutiny of the pieces themselves. The plot is often concluded in the first act, but still he goes on through the other four with great patience. The scenes are not linked together; the incidents are not prepared. Now Seneca could not have been ignorant of the common rules of tragedy, known universally in his day; and if he has not attended to them, we are forced to conclude it is with intention that he has done so.

His tragedies were written to be read, and they were read with great applause. They have not the rudest attempts at dramatic delineation. A story is chosen, always a well known one, on which to string descriptions, declamations, and epigrams. The dialogue is the most appropriate form for such exhibitions, and consequently he has told his story in dialogue. This seems to us the whole matter. Considered in this point of view, they possess great merits of a certain order. Their delineations are uniformly Stoical; their sentiments elaborated from philosophy, with very little poetry in them; their epigrams admirable. Seneca was not a poet. There was no poetry possible at his time, and if it had been, Seneca's mind was of a *reflective*, not of an *emotive* cast. And although most of the poetry in these tragedies is critical, conscious, and reflective—although we seldom see that spontaneity of thought and feeling which in true poets springs up from the simplest reflection—yet we cannot but be struck with certain passages of unquestioned power and freshness both of thought and expression. There is a magnificent flash of dramatic feeling and expression in his 'Œdipus,' which is worthy of Sophocles or Shakspere, and not borrowed from the former, as so many of his beauties were. It is when Œdipus has put out his own eyes, on learning that his wife Jocasta was also his mother (Jocasta has killed herself, and her corpse is before him on the ground), and determining to wander, blind as he is, from Thebes, the birthplace of his woes, he makes two steps in advance, but arrests himself *for fear of stumbling against his mother:*

'Siste, ne in matrem incidas.'

This is very pathetic, and shows an intensity of dramatic consciousness which we find nowhere else in Seneca. It is in his 'Medea' that the celebrated prediction occurs which is generally applied to the discovery of America; with what critical propriety, any one may judge who will take the trouble of turning to it. ('Venient annis,' &c.)

The tragedies of Seneca were translated into English by Jasper Heywood, son of the epigrammatist, by Alexander Neyle, by John Studely, by Thomas Nuce, and by Thomas Newton; and there appeared a complete edition in 1581, entitled 'Seneca his Tenne Tragedies, translated into English. Mercurii nutrices horæ' (Collier, *Hist. Dram. Poet.*, iii., p. 14); but the translators by no means adhered to the original, interpolating lines, speeches, and chorusses as they thought fit. The editions of Seneca are very numerous. The most recent edition of all his works is the Bipont, 1809.

SENECA LAKE. [NEW YORK.]

SENECA INDIANS. [NORTH AMERICAN INDIANS.]

SENE'CIO (from *senex*, on account of its silvery capitate seed-down resembling the grey hairs of an old man), a genus of plants belonging to the natural order Compositæ. The species of this genus are very numerous, but are not remarkable for either beauty or utility. The common groundsel (*Senecio vulgaris*) is one of the most common of weeds. [GROUNDSEL.] The flower-buds and young tops are gathered as food for young birds, and especially for domestic Canary birds. *S. saracenicus* (broad-leaved groundsel) was used by the Saracens as an application to wounds. A few of the species are cultivated, the most pleasing of which are *S. hieracifolius*, the hieracium-leaved groundsel; *S. pseudo-China*, the Chinese groundsel; *S. hastatus*, the spleenwort-leaved groundsel; *S. elegans*, the elegant groundsel. The two last may be readily propagated from cuttings or raised from seeds; the two first may be increased by offsets, but require to be constantly kept in the hot-bed of a stove.

SENEFELDER, or SENNEFELDER, ALOIS, the son of a performer at the Theatre Royal, Munich, was born about 1771 or 1772. The history of this persevering inventor, and of the difficulties with which he had to struggle in bringing the art of lithography into successful and profitable operation, supplies an interesting illustration of the power of genius to overcome the most adverse circumstances; it is little known to the English reader, the only source of information with which the writer is acquainted being the autobiography included in the history of his inventions, of which an English translation was published in 1819

Senefelder, when young, was inclined to follow the profession of his father, who preferred placing him at the university of Ingolstadt, where he devoted himself to the study of jurisprudence, occasionally indulging his predilection for the stage by performing at private theatres, and by employing his leisure time in dramatic composition. In 1789 he wrote a comedy, called 'Die Mädchenkenner,' which was published, and by which he cleared fifty florins. Losing his father soon after, he was compelled, from want of pecuniary means, to discontinue his studies; and he tried for some time to devote himself to the stage. Disappointed in his hopes of success as a performer, he resolved to try his fortune as an author, and published a second play, which did not pay his expenses. While this was passing through the press, Senefelder made himself acquainted with the process of printing, and became desirous of procuring the necessary apparatus for printing his own works. Being too poor to gratify this desire, he endeavoured to discover some other mode of printing, but was defeated in several plans by want of means. One of the projects he abandoned from this cause was a kind of stereotyping. [STEREOTYPE.] He then tried etching on copper, but found difficulties arising from his want of practical knowledge, and still more from the expense of the copper plates, which he ground and polished after using, to make them available for more than one operation. To diminish this difficulty, he used a piece of fine Kellheim stone for his exercises in writing backwards; and subsequently tried printing from it instead of copper, though without much success. Of this use of stone, merely as a substitute for copper, Senefelder disclaims the invention; but his experiments upon it were important, as leading to the discovery of chemical lithography. The next step towards this discovery was occasioned by an incident which curiously illustrates the situation of the needy inventor. Being unacquainted with the composition used by engravers for covering defective places in their etching-ground, or enabling them to rectify mistakes, he had invented a kind of chemical ink for the purpose, consisting of wax, soap, and lamp-black. One day, when he had polished a stone plate for etching, his mother entered the room, requesting him to write a bill for the washerwoman, who was waiting for the linen. He found that he had not even a slip of paper for the purpose, having used all in taking proof impressions, and that the inkstand was dry; and as the matter was urgent, he wrote the list on the prepared stone with his chemical ink, intending to copy it at leisure. Some time afterwards, when about to clean off this writing, it occurred to him that, by the application of aquafortis and water, he might etch the stone so as to leave the writing in sufficient relief for printing from. The experiment succeeded; and as soon as he had brought this new invention into a practical form, he applied himself to the means of bringing it into operation, so as to gain a livelihood by it.

Being unable otherwise to raise the necessary capital for the construction of a press, the purchase of stones, paper, &c., Senefelder enlisted as a private in the artillery, as substitute for a friend, who promised him a premium of two hundred florins, with which he hoped to procure the means for carrying on his operations in his leisure hours, until he could procure his discharge. With these views he went to Ingolstadt with a party of recruits. But he was doomed to disappointment; for it was discovered that he was not a native of Bavaria, and therefore could not serve without a special licence. While at Ingolstadt, he was led to conceive the peculiar fitness of his new process for printing music; and he suggested it to a musician of the Elector's band, named Gleissner, who was preparing some music for publication. In connection with this person a few works were published, which proved the capabilities of the art. The elector Charles Theodore sent a present of a hundred florins to the printers, and promised an exclusive privilege for the exercise of their art; but the Electoral Academy of Sciences, before which Senefelder laid a copy of the first work, with an account of the process, acted very differently. He had mentioned the small cost of the press as an illustration of the economy of his invention, and was grievously disappointed when, instead of an honourable mention in the 'Transactions' of the Society, he received a present of twelve florins, with an intimation from the vice-president that his memoir had been favourably received; and that, as the expense of the press did not, according to his own statement, exceed six florins, he hoped a double compensation would satisfy his expectations.

The promising aspect of affairs at this time, about 1796, was clouded by the difficulty of constructing a more efficient press than had been used in the first operations. A rolling-press had been used in the first instance; but owing to a circumstance which escaped the notice of Senefelder, he failed in his attempt to make a new one. He therefore made a machine, in which the pressure was obtained by a stone of three hundred pounds weight falling from a height of ten feet: a plan which produced good prints, but broke the stones after a few impressions. Having a narrow escape from being killed by the falling stone in this press, Senefelder abandoned it, and constructed another on a different principle. Such obstacles, and the difficulty of finding suitable persons to employ in the new process, brought the establishment into discredit, and prevented the proprietors from obtaining their expected exclusive privilege during the life of Charles Theodore.

The lithographic printing here alluded to appears to have been mechanical, as Senefelder informs us that he discovered chemical printing—the art which has since attained so high a degree of excellence and utility—in 1798. For the principles of this beautiful process, we must refer to LITHOGRAPHY [vol. xiv., p. 44]; and the history of its introduction must be treated of very briefly. Some of the earliest specimens of the art, as applied to pictorial subjects, were executed under the superintendence of the Rev. Mr. Steiner, director of the Royal School establishments. In 1799 Senefelder obtained an exclusive privilege for Bavaria for fifteen years, and carried on a considerable business, employing his two brothers and two apprentices. As the process was no longer kept secret, many persons visited the office, among whom was Mr. André of Offenbach. With this gentleman Senefelder entered into partnership, and commenced arrangements for obtaining patents and establishing presses in Vienna, London, Paris, and Berlin. While engaged in this project, he visited London, but without succeeding in his object. Unfortunate circumstances led to a hasty dissolution of this promising partnership, in 1800. For some time afterwards, Mr. Von Hartl, who is described as imperial court agent, took an active part in promoting the invention, the application of which to cotton-printing then excited much attention. A fair prospect which now appeared opening for Senefelder was destroyed by the derangement in the cotton-manufacture caused by the suspension of commercial intercourse between England and the Continent, by Bonaparte; and some improvements which he had effected in calico-printing became useless to him by being divulged by a person employed, before a patent was secured for them. In 1806 an extensive lithographic establishment was formed at Munich, by Senefelder, in connection with Baron Aretin and others. This partnership lasted about four years, during which period a great variety of works were executed; some of them for the government. Several other lithographic establishments were also in successful operation in 1809, when Senefelder obtained an engagement which rewarded him for the vicissitudes of the early part of his career, and placed him in comfortable circumstances for the remainder of his life. A lithographic office was formed about that time for printing the plans of a new survey of the kingdom, of which a great number were required. Owing to an intrigue, the superintendence of this work was not, in the first instance, given to Senefelder; but in October, 1809, he was appointed to the office of inspector of the Royal Lithographic Establishment, with a salary of fifteen hundred florins per annum, and with permission to carry on his private business also. The subsequent improvements effected by Senefelder were attributed by himself to the ease and independence which this honourable engagement afforded.

As early as 1809 Senefelder had commenced a collection of specimens to illustrate an account of his invention; but circumstances impeded the completion of the work, which might probably never have been finished but for the exertions of Mr. Von Schlichtegroll, director of the Royal Academy of Munich, who, in 1816 and 1817, published several letters on the subject, urging the publication of a work that should perpetuate the memory of the invention, and set at rest the erroneous rumours then prevalent on the subject. Senefelder therefore wrote and published an account of his inventions and discoveries, with a preface by Von Schlichtegroll, and a dedication to the king of Bavaria. This work was shortly translated both into French and English, the latter translation being published by Ackermann, in 1819, in a quarto volume, entitled 'A Complete Course of Lithography,' &c. It has no pretension to literary merit, but cannot fail to prove interesting as a simple and circumstantial record of the experiments and difficulties attending the invention of a highly important art. It enters minutely into private circumstances; but, as remarked in the preface by his friend, 'In the history of an important invention, minuteness cannot be called a defect. How interesting would it be to read all the private circumstances of the lives of John Guttenberg, or John Faustus, if a narrative of the origin of typography, similar to this of the origin of lithography, were in existence.' The illustrations of various styles, some of which are curious, add to the value of the work, to which is prefixed a portrait of Senefelder.[*] The latter part of the work contains a valuable body of instruction for the practice of the different branches of the art.

The rapid extension of lithography, even before the publication of this book, must have been highly gratifying to the inventor, who observed on this subject, 'I esteem myself happy in seeing, in my own life-time, the value of my invention so universally appreciated; and in having myself been able to attain in it a degree of perfection which, in a thousand other inventions, has not been reached till long after the death of the first inventor.' In 1819 the Society for the Encouragement of Arts, &c., in London, spontaneously voted their gold medal to Senefelder, as the inventor of lithography.

Senefelder married about the time of his appointment to the office in which, we believe, he spent the remainder of his life. He died at Munich, Feb. 26, 1834, in his 63rd year.

SENEGAL is the name of a large river in Western Africa, which enters the Atlantic by two embouchures between 15° 50′ and 16° 30′ N. lat. It is the largest river of Senegambia, and drains nearly half the surface of that country. The eastern and most mountainous parts of Senegambia, those which lie between 10° and 15° N. lat. and between 7° and 12° W. long., are traversed by numerous rivers, which, by their union, form the Senegal. The largest of these branches are the Ba Woolima and the Ba Fing. The last-mentioned river is justly considered the principal branch, as it traverses a much greater extent of country than the other rivers before it joins them. It rises, according to the statement of Mollien, near 10° 30′ N. lat. and 10° 45′ W. long., in the mountain-range which encloses the elevated table-land of Foota Jallon on the south, and divides the waters which fall into the Ba Fing from those which join the Kabba, one of the largest rivers of Sierra Leone. The Ba Fing flows first from north to south, but it soon turns eastward, and passes at a little distance to the south of Timbo, the capital of Foota Jallon. Soon afterwards it runs north, and in that direction it traverses the south-eastern portion of the plain of Foota Jallon. After a course of hardly more than 30 miles it enters the mountains which divide Foota Jallon from the Wilderness of Jallon Kadoo. Caillié, who passed it not far from Ba Fila, and the place where it enters the mountain-region, found that it ran with great rapidity between dark granite rocks, from which its name (Black River) is said to be derived. At this place it was about 100 feet wide, and the depth varied between 12 and 18 inches. Having passed through the mountains in a north-eastern direction, it turns north, and enters a less mountainous country, which it traverses in a north by west direction to its confluence with the Ba Woolima. Mungo Park, on his return from Bambarra, passed the Ba Fing near 12° N. lat., at the town of Manna, by a bridge of bamboos, of singular construction, of which he has given a sketch in the account of his first journey. The Ba Fing is joined by some large tributaries, of which the Furkooma runs more than 150 miles. The course of the Ba Fing to its junction with the Woolima exceeds 400 miles. The other great branch of the Senegal, the Ba Woolima, rises above 350 miles from the source of the Ba Fing, to the north-east, at the eastern extremity of the mountain-range which separates Senegambia from Soodan, and at no great distance from the banks of the Joliba, or Quorra, near 13° N. lat. and 6° 40′ W. long. Its course is first to the north-west, and then nearly west, at a short distance from the mountains, until it joins the Ba Fing, after having run more than 300 miles. From the south it is joined by the Kokorro, which exceeds 200 miles in length. The union of the Ba Fing with the Ba Woolima takes place near 14° 10′ N. lat. and 10° 30′ W. long., and from this place the river is called Senegal. About 15 miles below the union of its branches, the Senegal contains a cataract, called the Feloo Falls, which, according to the statement of Golberry, is 80 feet high. In this part the river runs north-west, but it soon turns to the west, and, at the distance of about 100 miles below Feloo Falls, it is joined from the south by the Ba Faleme, which flows more than 100 miles, and is navigable for a considerable distance from its mouth during the rainy season. Some miles farther down the Senegal is joined by a small river, which, according to the statement of Mollien, originates in a lake called Tiali, from which another river, the Nerico, issues in a southern direction, and falls into the Gambia. Thus during the rainy season a natural water-communication exists between the largest rivers of Senegambia. But we must observe, that both Mungo Park and Gray, who travelled very near to the common origin of these two rivers, do not mention such a circumstance. After having been joined by this small river, whose name is not mentioned, the Senegal leaves the mountainous and hilly country of Senegambia, and enters a plain which extends to its very embouchures. In this plain its course is first to the north-west, and afterwards to the west. In this part its course is extremely tortuous, the windings of the river being so numerous as to make its course double the length which it would have if it ran in a straight line. In that part of its course which lies to the west, the Senegal divides into two large arms, which reunite after having been separated for a distance exceeding a hundred miles. These two arms enclose two islands, called Bilbos and Morfil, which have an average width of six miles, and are separated from one another by a narrow arm of the river. The northern or principal arm preserves the name of Senegal, and the southern is called Morfil, or the River of Elephants' Teeth, on account of the great number of elephants which are said to live on its banks. After the two arms of the Senegal have reunited, it flows, chiefly in one channel, for more than 60 miles, but in approaching the sea it divides, near Faf, into two arms. The principal arm continues westward to the sea. The other arm, which is called Saguerai, runs south, and then south-west, and rejoins the principal arm after a course of nearly 50 miles, almost opposite the town of S. Louis. The principal arm, having approached the sea within six miles, divides again. The smaller branch, which is called the Marigot de Marigonines, or the River of the Moskitos, runs in a north-west direction until it falls into the sea: it may be navigated by small coasting vessels of sixty tons burden. The larger branch, or the proper Senegal, turns south by west, and flowing nearly parallel to the beach, gradually approaches the sea. Between the river and the Atlantic there is a strip of low land, nearly level, and covered with sand: it is called the Point of Barbary, and gradually diminishes in width, so that opposite the island and town of S. Louis it is less than 300 yards across. About five miles farther south it terminates at the mouth of the river. The tract of land enclosed by the Senegal and Saguerai consists of many islands, two of which are of considerable extent, and separated from one another by an arm which branches off from the Saguerai and joins the Senegal. The northern island is called Bequio, and the southern Bifeche. These islands are entirely covered with wood, and in the wet season a great portion of them is laid under water. The course of the Senegal, as far as it runs southward, is nearly forty miles long; but its waters in few places run in one channel, the middle of the river being occupied by a string of islands, some of which are several miles in length, and in some places more than half a mile in width. Even after its junction with the Saguerai the eastern banks continue to be skirted by islands. The greatest depth of the river is generally found to be west of the islands. Its currents are very rapid, and contain a large quantity of sand, which, when brought to the sea, meets the swell of the ocean, and is thrown back towards the land. Thus a bar has been formed across the mouth of the river, on which there is very little water, except at one place, where the currents have forced a passage through the sands: this is called the Pass of the Bar; it is generally about 250 yards wide and 15 feet deep, but these dimensions are subject to change. Only vessels drawing 12 feet water can pass through this entrance of the river, as the surplus is necessary for the pitching of the vessels which is produced by the strong swell of the sea. The mouth of the river was formerly two miles farther south than it is at present. In 1812 an unusually extensive inundation opened the present mouth, through the narrow sands of the Point of Barbary, and the old mouth was almost entirely filled up with sand.

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[*] Senefelder had wished to supply impressions of the original illustrations for the English translation of his work, an arrangement which would have greatly increased its value; but this was prevented by our Custom House regulations, as the prints for each copy of the book would have paid more than a guinea and a half duty. They were therefore copied, and printed at Ackermann's press.

As a navigable river the Senegal is far inferior to the Gambia; for the Gambia has no such obstacles at its mouth, and the Senegal is much inferior to it in depth, and so full of shoals that it cannot be navigated by large river-barges in the dry season. Gray states that at the end of the dry season it is only eighteen inches deep near Bakel, or Baquelle, the farthest of the French settlements. The ascent of the Senegal is only practicable in the wet season, and even then the voyage is slow and tedious, partly on account of the rapidity of the current, and partly because of the numerous windings. It may indeed be ascended to a greater distance than the Gambia, to the foot of the Feloo Falls, which are more than 500 miles from its mouth; but in general it is only navigated to the mouth of the Faleme. The river begins to rise some weeks after the rains have set in, generally in the first week of June; sometimes it attains the height of 40 feet above its lowest level at Bakel, but lower down it does not rise so high. It attains its highest level in the month of August, and begins to fall about the middle of September. In November or the beginning of December it again enters its bed. The inundations produced by the rise appear to be most extensive along the lower part of its course, especially where the islands of Bilbos and Morfil occur.

(Golberry's *Travels in Africa;* Mungo Park's *Travels in the Interior Districts of Africa;* Mollien's *Travels in Africa to the Sources of the Senegal and Gambia;* Gray's and Dochard's *Travels in Western Africa;* Savigny's and Correard's *Narrative of a Voyage to Senegal;* and Caillié's *Travels through Central Africa to Timbuctoo.*)

SENEGAMBIA is a term adopted by geographers to indicate a part of the western coast of Northern Africa, but it has not always been applied to the same extent of country. Originally it was only used to indicate the countries which lie between the Senegal and Gambia, from the names of which two rivers the term has been composed, or rather, only the tract between the European establishments on the banks of these rivers, for the country itself was almost entirely unknown in Europe nearly to the end of the last century. It is true that this part of the African coast was visited by Hanno, the Carthaginian admiral, and that it was again discovered by the Portuguese in the fifteenth century, between 1444 and 1469. [AFRICA, vol. i., p. 174.] The Portuguese also formed several commercial establishments near the mouths of the principal rivers, but they were neglected after the route to the East Indies had been discovered by Vasco de Gama (1497). The French and the English next tried to get a footing there, and the French acquired the Senegal about 1675, and the English the Gambia in 1686. They formed settlements at the mouths of these rivers, and their merchants began to trade on the banks, forming depôts for their goods at certain places. The remotest French commercial establishment was at S. Joseph or Makannah, not very far below the Feloo Falls, and the English advanced by degrees to Baraconda, some miles below the last rapids of the Gambia. Thus the course of these rivers and the countries immediately adjacent to their banks were explored, but nothing further was known up to the year 1788, when an association was formed in London for promoting the discovery of the interior parts of Africa. The year before, the settlement of Sierra Leone had been made for the negro slaves who had obtained their freedom in the West Indies. Since that period the interior of Western Africa has been explored by several travellers. Houghton traversed it in 1790 and 1791, from the banks of the Gambia in a north-eastern direction, but he did not add much to the information then existing respecting these countries, as he was killed in the town of Yarrow in Ludamar, before he had sent a detailed account of his travels. Winterbottom set out in 1794, from the mouth of the river Nuñez or Kakoondy, and went as far east as Timbo, the capital of Foota Jallon; and he first gave us some account of that part of Western Africa. Mungo Park, between the years 1795 and 1797, succeeded in traversing the countries drained by the upper branches of the Senegal, and in reaching the banks of the Joliba or Niger. As he took different roads in going and returning, a considerable part of the countries on the Senegal and Gambia rivers was explored by him, and he collected much valuable information respecting those parts which he did not see. This intrepid traveller considerably enlarged our information by his second journey (1805), when he again chose a different route through the countries drained by the Senegal. [PARK, MUNGO.] His death, and the threatening aspect which the war with France assumed at this period, put a stop to the zeal of the English for discovery in Africa; but after the return of the peace, the English government, wishing to open a trade between the countries on the Joliba and the settlements on the Gambia, set on foot a great expedition for that purpose, which was successively conducted by Peddie, Campbell, and Gray. Though this expedition did not accomplish its object, it traversed a great part of Senegambia in different directions (between 1817-20), and collected much interesting information. Denham and Clapperton succeeded in penetrating from Tripoli through the Great Desert, and reaching Bornou in Soodan, whence they advanced as far westward as Sackatoo (near 5° E. long.) Before these journeys were accomplished, Laing set out (1822) from Sierra Leone, and reached the town of Timbo by a different route from that chosen by Winterbottom and Campbell. After the return of Denham and Clapperton, the British made no other attempt to penetrate to the Joliba by the dangerous route through Senegambia, as they had formed a plan of reaching it by another way, which was nearly accomplished by Clapperton and Lander. In the mean time the French had begun to explore these countries. Mollien, departing (1818) from St. Louis, traversed the whole country between the mouth of the river Senegal and the sources of the Gambia, crossing the routes of the British travellers. He went as far as Timbo. The attempt of Beaufort, in 1824, to reach the Joliba did not succeed, and added little to our knowledge of the country, as he did not go farther than Bakel on the Senegal. Caillié however, in his great journey, traversed the country between the river Nuñez and Sierra Leone in 1827, and after having passed the Ba Fing, or Senegal, not far from its source, reached Timbuctoo, and returned to Europe by the Great Desert, and through the empire of Marocco.

By these numerous journeys we have acquired a tolerably exact notion of the natural features and productive powers of the countries of Western Africa which are drained by the rivers whose mouths are found between the embouchure of the Senegal (16° 30′ N. lat.) and the island of Sherboro (7° 30′ N. lat.). Consistently with this information, we shall divide these countries into two unequal parts, and name the northern and larger, or that which is drained by the rivers that enter the sea north of Cape Verga (10° 20′ N. lat.), Senegambia, and the southern and smaller part, Sierra Leone. The dividing-line between these two countries begins at Cape Verga, whence it extends in an east-north-east direction to the sources of the river Nuñez, and thence eastward to those of the rivers Rio Grande and Gambia. Near the latter terminates the elevated table-land of Foota Jallon, in which all the larger rivers of Senegambia take their rise, and where probably also the sources of the Joliba or Quorra are found. Towards the east Senegambia is supposed to comprehend all the countries drained by the numerous upper branches of the Senegal, and to extend to the high land which separates them from the countries on the banks of the Upper Joliba. A continuous ridge of high land extends along the northern side, and close to the banks of the Ba Woolima, or eastern branch of the Senegal, from its source to its junction with the Ba Fing, or western branch; and this ridge constitutes the north-eastern boundary of Senegambia. Farther west the valley of the river Senegal, which is bordered on the north by the great desert of the Sahara, is considered to be the most northern country belonging to Senegambia. The Atlantic Ocean washes its western shores, constituting a coast-line which probably exceeds a thousand miles in length. The countries enclosed within these boundaries cover an area exceeding 200,000 square miles; so that Senegambia may be compared with France in extent. From Cape Verde, its most western point, in 17° 30′ W. long., it extends eastward to the source of the Ba Woolima, which lies near 6° 40′ W. long., through a space about 480 miles in length. Cape Verga, its most southern point, is in 10° 20′ N. lat., and the valley of the Senegal approaches in some parts to the parallel of 17° N. lat.

Surface.—Senegambia comprehends a lower and a higher country. The lower country lies along the shores of the sea, and the higher extends over the interior. The dividing-line between these two large regions, which are nearly equal in extent, is tolerably well determined by a line drawn from Cape Verga to Debukko on the Nuñez and Kado on the Rio Grande towards the north-east, and then towards the north to the rapids of the Gambia above Baraconda, whence it extends again in a north-eastern direction to Bakel on the Senegal. Though the higher region is generally the more fertile and more populous, the several parts of both regions differ greatly in fertility.

The Country between the Senegal and Gambia.—The valley of the Lower Senegal consists properly of the bottom which extends along its course on both sides of the river from its mouth to Bakel. It is subject to inundations during the rainy season, during which the river in some places rises 40 feet above its lowest level. In some places this bottom is perhaps not more than five or six miles wide, but in others it spreads out to 15 or even 20 miles. As the subsoil consists of a light sand, which is covered with alluvial matter, it opposes little resistance to the rapid current of the river, and hence the Senegal frequently divides its waters, and forms arms which again reunite. Thus the river bottom is chiefly composed of a succession of smaller and larger islands, frequently intersected by narrow channels. These arms of the river, called *marigots*, are almost countless on the southern banks of the river west of 13° W. long. The main current of the Senegal runs in the channel which borders on the Sahara, and on the north of it the marigots are not numerous, nor of great extent. The whole bottom is of great fertility. In its natural state it is covered with forests, mainly consisting of trees of immense size, which occupy the greatest part of it, the cultivated places being neither numerous nor extensive, though they yield rich crops of rice, millet, maize, cotton, and tobacco. The population is not great, which may be attributed to the unhealthiness of the climate during and after the rainy season.

Between the mouth of the Senegal and that of the Gambia, and nearly at equal distances from each, lies Cape Verde (14° 40′ N. lat.), a wide projecting promontory. Its western extremity is a mass of rocks of moderate elevation and volcanic origin. In its character it greatly resembles the Cape Verde Islands, which are nearly 500 miles from it in the Atlantic Ocean. The northern descent of this isolated mass is rather steep, and at its eastern extremity are two hills rising about 600 feet above the sea: they are called *mamelles*, or paps, and serve as a beacon to mariners. From these hills the rocks descend gradually to the west and south. The central parts of this tract have a moderately fertile soil, which is well cultivated, and produces large quantities of cotton, two kinds of millet, and French beans. The uncultivated districts are used as pasture-grounds for cattle, or are covered with briars. In some parts, especially towards the western extremity, there are many large baobab-trees, and in others dates and pine-apples. This small tract contains about 10,000 inhabitants.

Cape Verde constitutes the point of separation between two coast tracts which differ greatly in natural features and productive powers. The country between the Cape and the mouth of the Senegal greatly resembles that part of the Sahara which extends from that river northward to the Bay of Arguin. Along the sea there is a low sandy beach, lined with sand-banks, on which there is so little water that it cannot be approached by the smallest boat. The country adjacent to the shores is a dead level, covered with a fine loose sand, which it is quite impossible to travel across, except where it has been covered and consolidated by the sea during the flood. It is quite destitute of vegetation, except in a few spots which are covered with a kind of hard and dry grass. During the rainy season the soil is drenched with water, and during the dry season is subject to dense fogs and heavy dews, which fall at sunset, and moisten and penetrate like the drizzling rains of Europe. But no stream of running water is formed by this abundant moisture. This flat sterile tract occupies the whole coast to the distance of about two miles from the sea. At the back of it rises an unbroken ridge of sandy downs of considerable height and rather steep acclivity. They are likewise destitute of vegetation, and seem to occupy a space from 6 to 12 miles in width. These downs prevent the waters which collect in the country lying farther east from reaching the sea, and hence extensive swamps are formed at the base of their eastern declivity. These low grounds are almost entirely covered with water during the rainy season, but in the dry season a great portion of the swamps is dried up, and as the alluvial soil is of great fertility, it produces rice and indigo, with large quantities of mandioc and yams. For want of information we are unable to determine the extent of this swampy region towards the east, and the line where it borders on the table-land of the Jaloofs, nor do we know anything of the amount of the population.

The country contiguous to the shores of the Atlantic, between Cape Verde and the mouth of the river Gambia, is of a different description. The coast-line is well defined, but does not extend in a straight line. It is also broken by several watercourses. The low beach is covered with mangrove-trees. The country rises gradually from the beach to the distance of 30 or 40 miles, and probably farther, though our knowledge of this part of Senegambia does not extend farther into the interior. The whole tract, in its natural state, is covered with tall forest-trees, but a considerable portion of it is under cultivation, producing rice, maize, and millet in abundance. The cattle which pasture on the cleared grounds are of great size. All these products, together with pigs and poultry, are taken from these parts to the French and English settlements, especially to Goree. There are several small harbours on this coast, Red Cape, Portudal, Serine, Fatik, and the mouth of the river Joombas. The last-mentioned may be entered by vessels of considerable size. This part of Senegambia is rather populous, and probably contains from 300,000 to 400,000 inhabitants.

To the east of the countries hitherto noticed lies the table-land of the Jaloofs, which is of great extent, occupying the whole country between the valleys of the Senegal and Gambia from 16° to 13° W. long. The interior of this vast region seems to resemble the country which divides the valley of the Senegal from the Sahara, but its character is not known, as it has not been visited by travellers, and appears to be only inhabited by some wandering tribes during the rainy season, on account of the pastures which are found there at that time. The most elevated portion of the table-land seems to be situated between 14° and 15° 10′ N. lat., and between 13° and 15° W. long., but the declivities extend north and east to the valley of the Senegal, south to that of the Gambia, and west to the swamps already mentioned. Towards the mouth of the Senegal they approach very near to the river, enclosing even the lake of Gher, or Panieh-Fool, which is about 30 miles east of St. Louis, and extends from south-west to north-east about 18 miles, with a breadth varying from one to two miles. These declivities have been seen by travellers, who found that their surface was almost entirely covered with a reddish sand, which absorbs abundance of moisture without acquiring the least degree of fertility. Still there occur some tracts of moderate extent which are enclosed by higher grounds, in which the waters of the rainy season have collected, and given to the sand a mixture of mould which so far fertilises these tracts that millet can be cultivated on them. In these depressions villages are situated, but they occur only at great distances from each other. Water is only to be obtained from wells, which vary from 20 to 80 yards in depth, and in making these wells it was found that a thick stratum of sand covers a subsoil entirely composed of ferruginous stone. These stony masses appear to constitute the upper soil of the more elevated portion of the table-land. It produces nothing but a few shrubs and some isolated trunks of the enormous boabab, which seem to vegetate best in the soil where other trees languish. Where the ground is not entirely composed of this ferruginous rock, large forests of acacias are found. The most fertile portion of this inhospitable region is the north-eastern declivity, where the surface is much less level, and in many places interspersed with high hills and short ridges, between which there are many tracts of considerable extent, on which millet, cotton, and indigo are cultivated, and on the pastures of which large herds of cattle are fed. This is particularly the case near the only two rivers by which this region is drained, the Saldi and Guiloom. The ferruginous rocks here also cover large tracts, but the inhabitants have turned them to account, having in many places furnaces to smelt them for the purpose of extracting the iron. This part of the table-land, though much less fertile than the adjacent valley of the Senegal, appears to be no less populous.

South-east of the table-land of the Jaloofs begins the higher country, which does not however immediately rise into mountains, but the western districts consist of numerous hills and short ridges, rising to a moderate elevation. A range of mountains which runs along the western banks of the Ba Faleme may be considered as the boundary-line between the hilly and mountainous country. The hills, consisting mostly of ferruginous rocks, from which iron is extracted, are for the most part thinly covered with low stunted wood, little of which is fit for anything but fuel. The valleys and level grounds which are enclosed by these hills are in many places rather extensive, and mostly cleared for the purpose of cultivation, to which the soil is well adapted. The beds of numerous torrents intersect the valleys in every direction: they are dry in the dry season, but during the rains they conduct the water which is collected on the high grounds to the Faleme and Gambia. During the dry season, water, except near these rivers, can only be obtained from deep wells. Towards the source of the Faleme the country, though more elevated, is much less broken, and there occur some extensive plains, which are partly covered with woods and partly with jungles of bamboo. A very small part of them is cultivated, and they are the haunts of wild beasts, especially of elephants and lions. Though there is perhaps no part of Senegambia of equal extent more populous than this hilly region, only a small proportion of its surface is under cultivation. Millet, maize, rice, cotton, and indigo are extensively cultivated. Besides tobacco, there are cultivated red pepper, water-melons, pumpkins, gourds, onions, and pistaccia nuts. Numerous tamarinds, boababs, *rhamnus lotus*, and other fruit-trees are scattered over the valleys, and many parts of the country are very picturesque. The inhabitants are tolerably rich, which is partly owing to the circumstance that the most frequented commercial road between Soodan and the European establishments on the coast passes through this region.

The mountain-region extends over the western portion of Senegambia, including all the countries situated on and between the numerous rivers which, by their confluence, form the Senegal. As far as our knowledge goes, this region is surrounded on the south, east, and north by a continuous range of mountains, which divides it from the western countries of Soodan. The south-western portion of this range is connected with the elevated table-land of Foota Jallon between the sources of the rivers Ba Fing and Joliba, probably near 10° W. long., and between 10° and 11° N. lat. From this point it extends in an east-north-east direction to 6° 30′ W. long. where it declines to the north and north-west; but it soon runs west by north, in which direction it continues along the northern banks of the Ba Woolima to the confluence of that river with the Ba Fing (10° 30′). Thus this range forms an irregular semicircle. At its western extremity it seems to enlarge into a mountain-region, which extends westward to some place nearly due north of St. Joseph, or Makanna, on the Senegal. The elevation of this range is not known. In a few places where it has been crossed by travellers, it does not rise above the line of trees. The highest part is known by the name of the Fooladoo Mountains, which lie on the northern banks of the Woolima River, between 9° and 10° W. long. The western boundary of this region is formed by another range, which is connected on the south with the mountain-region in which the rivers Gambia and Rio Grande originate. From this region it branches off in a north-north-west direction, and its northern extremity seems to terminate in hills on the western banks of the Ba Falème, not far from its junction with the Senegal. This range does not appear to form a connected series of heights, as Mungo Park does not mention that he passed over a high ridge in travelling from the banks of the Upper Ba Falème to those of the Gambia river. The region which is enclosed by these ridges, being farther from the coast than any other part of Senegambia, is the least known portion of it; and we have no other information than what is contained in Park's 'Travels.' It seems that the whole is occupied by rocky ridges, which however do not attain the elevation of the range which separates Senegambia from Soodan. The direction of the watercourses shows that these ridges extend in a general direction from south-east to north-west. It is remarkable that in such a mountainous country, which for five or six months is subject to heavy rains, water is scarce at some distance from the watercourses, a fact which is owing to these ridges consisting almost entirely of iron-stone and slate with a very thin covering. They are generally bare, or only covered with isolated stunted shrubs. In the valleys, which in some parts are extensive, a good deal of alluvial soil is found; and in these places millet, maize, and other grains are cultivated. In the valleys there are also many high trees which occasionally extend up to the ridges. On the southern district is a wilderness, partly covered with trees and partly with dry bamboos. It extends upwards of 100 miles from east to west, and is inhabited by wild beasts. This region is rich in metals. Excellent iron is obtained by the negroes from the iron-stone; and there are several places where gold in considerable quantities is collected.

The Valley of the Gambia and the Country south of it.—The country situated immediately on the banks of the Gambia, as far as Pisania, consists of a level alluvial tract extending about two miles from the river. It is subject to annual inundations during the rains. A great part of it is swampy, or covered with mangrove-trees; in other places the ground has been cleared, and is cultivated with rice At the back of this low tract the country rises to a moderate elevation above the level of the river when swollen by the rains. The surface of this higher ground is in some parts tolerably level, in others diversified with gentle eminences, and there are also a few hills and broken tracts. The soil is very various. Though often sandy, it is rather fertile; but sometimes it consists of a hard yellow clay, mixed with small quartz pebbles, and is of indifferent quality. Woods still cover a considerable part of the surface, but the trees are not lofty. Baobabs, tamarinds, the rhamnus lotus, and other fruit-trees are grown in several places; but the principal objects of cultivation in the cleared grounds are mandioc, maize, cotton, indigo, and French beans Where this region approaches the table-land of the Jaloofs, the soil consists of a mixture of dark red sand and small iron-stone gravel, is unfit for agricultural purposes, and only covered with low stunted trees, mostly mimosas and acacias.

The coast-line between Cape St. Mary, situated at the mouth of the Gambia, and Cape Verga, is extremely low, and is intersected by numerous channels, which form many islands. It is said that the whole space between the Gambia and Nuñez is occupied by an archipelago of low islands, and that the channels which divide them may be navigated at high-water by vessels of four or five feet draught, so that they may pass from one river to the other amidst the islands of this extensive archipelago. The natives affirm this to be the fact, but that they are prevented from using this navigation by the hostile tribes which inhabit the islands. The mud-banks which surround these islands towards the open sea so dangerous to larger vessels that a part of the coast between the river Compoonee and the Rio Grande has never been surveyed, and is laid down on our maps at random. These low islands consist mostly of mud, and are covered with mangrove and palm trees. Though they do not contain fresh water, they are not only inhabited but populous. It seems that the inhabitants use the palm-wine as a substitute for water. They cultivate some roots and rice, but chiefly occupy themselves with making salt, an important article of commerce in these parts of Africa, as all the salt consumed in Soodan is either obtained from the Sahara or from this coast. This low archipelago constitutes the outer edge of a level and low country, which extends to a great distance inland. It seems for the most part to be composed of alluvial soil, and the large rivers which traverse it divide into many arms, several of which reach the sea, whilst others re-unite. It is conjectured that all the rivers between the Gambia and Compoonee are united by such channels branching off from the rivers, especially from the Rio Grande. The whole country to a great distance from the shore thus resembles a net-work. It is of great fertility, but in general very little cultivated, though it produces rice, maize, yams, mandioc, bananas, papaws, guavas, and oranges in great abundance. The greater part of the country is covered with high trees, and supplies good timber for the European settlements on the coast. In some places there are savannas, which serve as pasture-ground for large herds of cattle.

At the back of this low plain, between 14° 30′ and 13° W long., lies a more elevated country, constituting a kind of second terrace. Its surface is slightly undulating, hills not being numerous except towards the southern and eastern boundaries, where this terrace borders on the mountain-region. The soil of this country, so far as it is known, has a considerable degree of fertility. The depressions of the surface are like reservoirs, in which the water collects during the rain, and at that season they are converted into swamps, but the inhabitants avail themselves of this circumstance to cultivate rice to a great extent. They also grow millet and maize, with cotton, indigo, and several roots and fruit-trees. The inhabitants are said to be careful and industrious agriculturists. They have also large herds of cattle, sheep, goats, and pigs, and rear much poultry. In no country perhaps on the globe are bees more abundant. Honey and wax are great objects of trade. The Portuguese export large quantities of the wax from their settlements on the several branches of the Rio Grande.

The mountain-range south of the Gambia begins a little west of 13° W. long. The country does not rise immediately into mountains, but a large part is covered with hills, which rise gently above one another, and are covered with large clumps of trees. The valleys between them have a fertile soil, but cultivation is not much attended to. Farther east there are several ridges of mountains. Between the Gambia and Rio Grande they appear to approach 13° W. long., but south of the last-mentioned river they do not pass much to the west of 14° W. long., except that a ridge approaches the river not far from Kade. These mountains are very little known. Those which fill up the country between the principal branch of the Rio Grande and its confluent the Coomba are called the Tangui Mountains, and another ridge, south of the Rio Grande, the Badet Mountains. Their elevation seems to be considerable, but they do not appear to rise above the line of trees. These two ridges unite with others at the place where the Gambia and Rio Grande originate, and here they constitute a mountain-knot which forms the western and northern boundary of the table-land of Foota Jallon. The mountains are mostly bare, their surface consisting of ironstone, greyish ashes, and yellow sand; in some places they exhibit traces of volcanic action. The valleys are covered with large trees. The inhabitants are mostly herdsmen.

The table-land of Foota Jallon consists properly of a plain of considerable extent, surrounded by higher grounds, and chiefly by lofty mountains. From north to south it extends about 80 miles, and perhaps still more from east to west. The surface is diversified by gentle hills. The elevation of this plain is not known, but it can hardly be less than 2000 feet above the sea. In the mountains which enclose it on the south, and which appear to be connected with the Kong Mountains, are the sources of the Ba Fing, the principal branch of the Senegal, and the waters issuing from them run above a thousand miles before they reach the sea. This river traverses the southern part of the plain, receiving all the waters collected on the surrounding mountains: it forms many rapids in its course through the chain which encloses the plain on the east, and finally enters the mountain-region of Eastern Senegambia. The greatest part of the plain is converted into a temporary lake at the end of the rainy season, but this is very favourable to the growth of rice, which is extensively cultivated. Indian corn is also grown, but millet, to the growth of which humidity is not favourable, is seldom seen. Among the fruit-trees oranges and papaw-trees are most numerous, and the bananas are cultivated with care. The baobab does not exist, but there are many other trees of prodigious dimensions. Cattle are rather numerous. This is certainly the best cultivated part of Senegambia, and also the most populous. Along the roads by which the Europeans travelled who visited this country, villages and towns occur at short distances from one another, and in some parts the plantations were nearly contiguous. The inhabitants derived considerable advantages from the commercial road through their country which connects the countries south of the Joliba with Sierra Leone. The elevated ground which extends from the south-western edge of the table-land westward to Cape Verga does not appear to rise to a great elevation, the highest summits probably not exceeding 3000 feet above the sea. Towards Cape Verga they are of moderate height.

Rivers.—Besides the Senegal and Gambia, which are the largest rivers of Senegambia, the country south of the Gambia is drained by two rivers, which are navigated to a considerable distance from their mouth: these are the Rio Grande and the Nuñez or Kakoondee.

The Rio Grande is stated to originate on the western declivity of a range of mountains, the waters from the eastern slope of which form the most remote branch of the Gambia, near 10° N. lat. and 11° W. long. As far as its course lies within the mountain-region, it is joined by numerous tributaries, among which however the Coomba only is a considerable stream, and its course is rapid. Before it leaves the mountain-region it is said to form a cataract near 13° 20′ W. long., and from this point downwards the river is navigable for river-boats. At a distance exceeding a hundred miles from the sea the river divides into several branches. That branch which continues to flow in a western direction is commonly called on our maps Rio Grande, but the native name is Butolah. Small vessels may ascend it as far as Bolola, a short distance below the bifurcation. Its mouth is opposite to Bulama Island, which belongs to the group of the Bissagos or Bijooga Islands. [Bissagos.] That arm which runs northward from the point where the bifurcation takes place is called Jeba river. Having continued in that direction about 50 miles, it turns westward and divides again at the Portuguese settlement of the same name. This branch is navigable for small vessels from Jeba to the sea, and for larger vessels from a point about five miles above Bissao. The most northern arm, which is called the Cacheo river, is navigable for vessels drawing not more than ten feet water to the settlements of Cacheo; and for smaller ones much farther. As the country between these arms is exceedingly low, and its soil mostly consists of alluvium, which is inundated for some months in the year, there is said to be a great number of minor channels by which the principal branches of the rivers are united.

The river Nuñez, or, as it is called by the natives, Kakoondee, is much inferior in size: its whole course probably does not exceed 250 miles, while the Rio Grande runs more than 400; but it offers a safe navigation to a great distance from the sea. It rises in that chain of hills which separates Senegambia from Sierra Leone near 13° W. long., and its general direction for about two-thirds of its course is to the west, and the remainder to the west of south. In the upper part of its course it is full of rapids and falls. It becomes navigable for vessels of moderate size above the settlement of Debucko or Rebucko, and up to this place the tide ascends. From this place downward the general depth of the river may be stated at two and a half to three fathoms at low-water, with a rise and fall of about twelve feet. The river has three channels at its mouth, two of which are navigated by vessels. The northern admits only vessels drawing less than twelve feet, but the southern may be entered by large ships. They are separated from one another by an island called Sandy Island. The low country near its mouth is uninhabited for want of fresh water, and the first settlement, Walkeria, occurs at the distance of 70 miles from the sea, measured along the course of the river.

Climate.—The year is divided between the rainy and the dry seasons. The commencement of the rainy season varies between the 1st of April and 1st of June, and its termination is between the 1st and 31st of December. The rains in the beginning are neither frequent nor heavy; but towards the end of June they begin to increase, and in July and August they sometimes continue for two or three days together. They are frequently accompanied by violent gusts of wind, called *tornadoes*, attended with thunder. In September the rains are generally slight, and tornadoes with heavy rains are comparatively rare. In October and November only slight rains occur at intervals of several days. Tornadoes occur at the beginning and termination of the rainy season. The prevailing winds during this season are from the south-west to the west and north-west; towards the end of November, from the north-east and east, and they immediately produce a great change in the face of the country. The grass soon becomes dry and withered; the rivers subside rapidly, and many of the trees shed their leaves. About this period the *hamattan* is generally felt, a dry and parching wind which blows from the north-east, and is accompanied by a thick smoky haze, through which the sun appears of a dull red colour. This wind has been compared with the samiel of the Arabian desert, but it does not produce such hurtful effects. It blows from that side where the Sahara is situated, and passing over its sandy plains, it acquires an extraordinary degree of dryness, parching up everything which is exposed to it. It is however considered healthy, especially by the Europeans. During the long rainy season the air is so loaded with moisture, that the inhabitants may be said to live in a sort of vapour-bath, and everything which is not close to the fire becomes damp and mouldy. The hamattan quickly changes this state of things, and many persons who have fallen ill during the rains, recover in a short time. But it produces chaps in the lips, and afflicts many of the natives with sore eyes. The easterly winds of the dry season extend to the shores of the sea as far south as Cape Verde. But south of it, Captain Belcher, in surveying this coast, found that the westerly and especially north-westerly winds were almost continuous, except in some places where there is a regular alternation of land and sea breezes, the land-breeze blowing with great regularity from 10 o'clock in the evening till sunrise. In these parts there is always a haze over the land during the dry season, particularly in the day, by which the view is very much limited; but in the rainy season every shower clears the atmosphere, and distant objects are distinctly seen.

Senegambia has long been noted for the great degree of heat to which it is subject all the year round. It was considered to be the hottest country on the globe, at least of those which border on the sea. But this opinion was founded on imperfect observations. It does not appear to be subject to a greater degree of heat than other countries situated in the same latitude, except those tracts which lie along the banks of the river Senegal, and consequently in the vicinity of the Sahara. The French settlement of Bakel on that river is more than 300 miles from the sea in a straight line, and consequently its temperature can be little affected by the ocean, while it is much affected by the vicinity of the desert. In Gray's 'Travels in Western Africa' there is a summary account of the temperature of that place, according to which it appears that during the five months of heavy rains, from July to November, both included, the mean temperature is 82·62°; for the three following months (December to February) 78·12°; and for the remaining four months 86°. The mean annual temperature appears therefore to be somewhat above 83°, or four degrees higher than along the coast. The thermometer occasionally rises to 110° in April and May, which are the hottest months of the year, and sinks in December to 56·25°, which gives a range of 54° of the thermometer during the year. We are almost entirely without information respecting the temperature of the mountain-region. A few observations in Gray's travels seem to indicate that the temperature, not far from the sources of the Rio Grande, is from 10 to 12 degrees lower than that of the low valley of the Gambia near Pisania, and it is probable that the temperature of the table-land of Foota Jallon is still lower. In all the parts of Senegambia which are remote from the coast, the hottest part of the year is during the last months of the dry season and at the beginning of the rains; but on the coast the rains immediately depress the temperature several degrees. On the coast, the range of the thermometer generally varies between 65° and 95°, and rarely attains 100°. The mean annual temperature is 79·7°.

Productions.—A country with such a climate and extensive tracts of great fertility must be capable of producing all kinds of tropical vegetable products. It does not appear that any of our grains are cultivated, nor other plants which constitute important objects of agriculture in Europe, with the exception of hemp, which however is not exported, but made into ropes and cords, in which state it is brought to the European settlements. The grains which are cultivated to a great extent are rice, maize, and millet. Rice is chiefly grown in great abundance in the valleys of the rivers, which are all subject to inundation during the rainy season; but it is also raised in the lower districts, particularly in the country surrounding the numerous arms of the Rio Grande. In the more elevated tracts, and especially in the mountain-region, maize is the principal grain which is cultivated, and millet is extensively grown in the more sterile parts, especially between the Senegal and Gambia. Besides these grains there are cultivated for food the ground-nut, mandioc, yams, and bananas. The most common vegetables are red-pepper, pumpkins, water-melons, gourds, sorrel, onions, a kind of French beans, and ginger. Cotton and indigo are grown in many places; the latter grows wild. The fruit-trees of Europe do not succeed, except oranges, lemons, figs, and vines; those which are cultivated are rhamnus lotus, dates, papaws, guavas, and pistaccia-nuts. The forests contain several trees, the fruits of which are used as food. The most remarkable is the butter-tree (*Elæis Guineensis*). The immense forests which cover a great part of the country consist of a great variety of trees, among which the baobab is distinguished by its size. Other trees are used as timber, dyes, or for cabinet-work, as the African teak, the mahogany-tree, the mangrove, and others. Several articles of commerce are collected in the woods. The mimosa from which the gum is obtained is common on the table-land of the Jaloofs, though less so than north of the Senegal. There are some trees which yield caoutchouc. Cassia and cardamums are brought from the interior to the coast. Orchil, an important article in the Portuguese settlements, is also collected in the interior. Along the sea-coast, and also on the islands, and in the low flat country between the Rio Nuñez and the Gambia, different kinds of palms are found in great abundance; palm-oil and palm-wine are important articles of domestic economy. The cabbage-tree is also common.

The domestic animals do not differ from those of Europe, except that a few camels are kept in the desert of the Jaloofs and in the countries near the Sahara. Horses are numerous and the breed is good. A great number are shipped from the Gambia to the Cape Verde Islands and Sierra Leone. Black cattle is very plentiful and of great size. Butter in a melted state is a considerable article of inland trade, and hides and horns are largely exported. Sheep and goats are confined to some tracts, but pigs and fowls are reared everywhere, the negroes being very fond of pork, though those who are Mohammedans abstain from it. Among the wild animals the elephant occupies the first place. Though not common in the low swampy countries along the coast, in the interior, and especially in the wooded country between the upper courses of the Gambia and Faleme, and in the Wilderness of Jallon Kadoo, there are numerous herds of elephants, and from these parts nearly all the ivory is brought which is exported from the English and Portuguese settlements on the Gambia, Rio Grande, and Nuñez. The tusks of these elephants however are in general not so large as in the countries nearer the line. The hippopotamus is numerous in all the rivers, especially in the Senegal. It is even found in the sea which separates the Bijooga Islands from the continent. There are lions, leopards, and panthers. The striped hyæna is very common. The wild animals which are used for food are the buffalo, the wild boar, which is of prodigious size, deer of different kinds, antelopes, the hare of the Cape, and porcupines. There are also several kinds of monkeys, some of which are eaten. The cynocephalus is destructive to the fruits. Alligators frequent all the rivers, and the boa is found in the lower marshy country. Among the birds the white heron is one of the most beautiful. Guinea-fowls, turtle-doves, and wood-pigeons are abundant. Plovers of various kinds, wild ducks and geese, are met with in immense flocks on the edges of the marshes in the lower country. On the desert islands and cliffs along the coast there are large flocks of boobies. Turtles are rather numerous on some of the islands. The rivers do not abound in fish so much as the sea, particularly round the Bijooga Islands. Perhaps there is no country on the globe where bees are more common; honey is a considerable article of inland trade, and wax in large quantities is exported. There are several kinds of large ants; their hills resemble the huts of the negroes.

We know very little of the mineral wealth of Senegambia; but it would seem that the greater part of the mountains are mainly composed of iron-stone, and that iron exists there in inexhaustible quantity. The natives are also acquainted with the art of extracting the metal, and there are furnaces in some parts. The iron thus obtained is of various quality; some is said to be very malleable. Gold is found in those parts which lie between the affluents of the Upper Senegal, as in Bambook, Fooladoo, Manding, &c. It occurs mostly in the form of small grain or powder in an alluvial soil. Part of it reaches the European settlements on the coast; but the greater part goes into the interior of Africa and the countries on the Mediterranean by the way of Timbuctoo.

Inhabitants.—The inhabitants of Senegambia belong properly to the negro race. But it appears that from a very remote period the Moors, who inhabit the north-western part of Africa, and wander about in the Sahara, have entered Senegambia in considerable numbers, and mixed with the most populous tribes of the negro race. These tribes are known under the names of Foulahs or Foolahs, Jalofs or Jaloofs, Mandingoes, and Serrawollies; and they occupy the more elevated part of Senegambia, leaving to the other minor tribes only the low country which extends along the sea from the mouth of the Gambia to Cape Verga. The most northern of these smaller tribes are the Sousous and Feloops, who inhabit the country between the Gambia and Rio Grande. The islands formed by the last-mentioned river are occupied by the Papels and Balantes. The Landamas live between the Rio Grande and the river Nuñez, the Naloos south of the Nuñez, and the Bagoes on the low shores of the sea on both sides of the Nuñez.

The nations among which the Moors have settled have partly embraced the Mohammedan religion. The structure of their body differs also more or less from that of the true negro race. The inhabitants of Bondoo, who are a mixture of Foolahs, Mandingoes, Serrawollies, and Jaloofs, are described as of middle size, well-made, and very active; their skin of a light copper colour, and their faces of a form approaching nearer to the European type than any of the other tribes of Western Africa, the Moors excepted. Their hair too is not so short and woolly as that of the negroes, and their eyes are larger and rounder, besides being of a better colour and more expressive. The women in particular vie in point of form with the handsomest women in Europe, and they have very delicate features. The different tribes speak different languages; but that of the Foolahs and Mandingoes is generally understood by all of them. In point of civilization they are far more advanced than the other black tribes. They cultivate the ground with industry and skill; they are well acquainted with the advantages of commerce; they are active traders, and they manufacture clothing, the different articles of household furniture which they require, together with the implements of husbandry, carpenters', blacksmiths', and leather-workers' tools and knives, spear and arrow heads, bridle-bits, and a variety of small articles. All these things, taking into account the very rough materials and tools that are employed, are finished in a manner which shows great taste and ingenuity on the part of the workmen, and leads to the supposition that they have practised those arts for a long time. There are schools in almost every town for the instruction of youths who intend to make the Mohammedan religion their profession, in which they are instructed in reading and writing Arabic from the Korán. Their habitations are rather small, but they are kept clean and neat. They do not go naked, but are dressed in a very decent manner. The women dress in cotton stuffs of their own manufacture, except that some have a few pieces of silk and painted cotton, which they obtain from the European settlements on the coast.. They always wear a veil thrown loosely over the head, which is intended to imitate thin muslin; and it must be admitted that they have by no means made a bad attempt.

The smaller nations, who exhibit in their bodily structure the true negro type of the Ethiopian race [MAN, vol. xiv., p. 363], have remained in a much lower state of civilization, though they are much above the savages of South America. They cultivate some rice, but in a very unskilful and slovenly way. They have plenty of pigs and fowls, but few cattle, and no other domestic animals. They generally wear only a piece of cloth about their loins. Their huts are extremely dirty, and their habits are improvident. They are ferocious in their manners, treacherous, cruel, and oppressive; and a tribe of the Bagoes are complete pirates.

Political State of Society.—We have little information on this point respecting the smaller and less civilized tribes. It appears that little authority has been introduced among them, and that in this respect they resemble the savage tribes of America. They do not keep slaves, and have adopted the practice of selling their prisoners of war to the slave-traders.

The larger tribes however have established regular government. In most of the small and independent states of Senegambia it resembles the government which formerly existed in Poland, the administration of the country being in the hands of the king and an hereditary nobility. Each town or district is under a chief. It would also seem that certain revenues,—as, for instance, the presents received from the merchants who traverse the country with goods,—are divided among these petty chiefs. But the king has the power of making war and peace. In case of war, the chief of each village must proceed to head-quarters with his followers. All these nations keep a considerable number of slaves. The government of Footatoro is a kind of theocratical republic.

Political Divisions and Places.—The whole country along the sea, from the mouth of the Senegal to Cape Verde, and as far inland as the western declivity of the table-land of the Jaloofs, is subject to the king or Dámel of Kayor, who resides in the town of Macaye, of which place we have no information. The inhabitants are Jaloofs. Within the boundary of this state is the town of Cogue, which is a commercial place, as two roads unite here, one leading southward to the Gambia, and the other eastward to Footatoro. It has 5000 inhabitants, and many Moors are settled there. The numerous villages on the rocky peninsula of Cape Verde constitute an aristocratical republic, governed by a senate, which is composed of the chiefs of these villages.

Between Cape Verde and the mouth of the Gambia are the small states of Baol, Sin, and Barra. Baol is dependent on Cayor. Sin contains the small harbour of Jaol. Barra comprehends the country north of the mouth of the Gambia, where the king resides in the town of Albreda with 3000 inhabitants. The French have a commercial establishment at this place. East of Barra is the small state of Badiboo. The countries are inhabited by Jaloofs, with the exception of Barra and Badiboo, where Mandingoes are numerous.

North of the two last-mentioned states is that of Salum, which extends westward to the sea, where it occupies both sides of the river Joombas. The capital Cahore is built on its banks, and small vessels can ascend as far as the town. It is a considerable place, and has some commerce with the French settlement of Goree. On the east Salum extends to the banks of the Gambia, and on the river is built the town of Kawour, a commercial place with 800 inhabitants. The population consists of a mixture of Jaloofs and Sousous. Between Salum and the state of Wooli, which lies farther east, are the two small states of Yanimaroo and Katoba, both on the north bank of the Gambia. In Katoba is the small commercial place of Kayaye, where an English merchant resides. The inhabitants are a mixture of Mandingoes and Sousous. Wooli is mostly inhabited by Foolahs. It extends a considerable distance along the banks of the Gambia, and Medina, the capital, has about 1000 inhabitants; but in its vicinity there are some still larger places.

On the southern bank of the river Senegal, not far from its mouth, begins the kingdom of Walo, which extends nearly to the western extremity of the island of Morfil. It is inhabited by Jaloofs and the capital is Ender. The islands of Morfil and Bilbos, and the country south of them along the Marigot of Morfil, are inhabited by Foolahs, subject to a sovereign called Siratic. On the northern declivity of the table-land of the Jaloofs is the state of Burba Jaloof, inhabited by Jaloofs; it is of great extent, but a large part of it is a desert. The residence of the king is Wamkror. On the eastern declivity of the table-land lies the state of Footatoro, which comprehends also the low land along the western banks of the Senegal, where it runs north-west. This country, which is more extensive than most of the others, is divided among seven chiefs, who form a council, and elect a marabout, or priest, for their king, who however can do nothing without the consent of the council, and reigns only during its pleasure. It frequently happens that this chief of the federative aristocracy is changed two or three times in a year. The capital of Footatoro is Chuloigne. Sedo and Canel are rather large towns. The inhabitants are chiefly Foolahs.

The states hitherto noticed are situated in the lower region between the Senegal and Gambia. In the mountain-region and contiguous to the western and southern banks of the Senegal is Galam, which comprehends the country from the Falls of Feeloo (10° 30′ W. long.) westward, but does not extend to a great distance from the river. It is divided into Lower and Higher Galam, by the Ba Faleme. The latter is also called Kajaaga. It is densely inhabited, a string of towns occurring along the banks of the river, among which Tuabo, Makanna, and Mussala are considerable places. At some distance from the river is the town of Joag. The inhabitants are mostly Serrawollies; they are much engaged in trade with the French who are established on the banks of the Senegal and the countries which lie farther east as far as the Joliba. They are distinguished by their manufacture of cotton stuffs, to which they give a fine and permanent blue colour.

Between Galam and Wooli on the Gambia is Bondoo, the most powerful state in these parts of Senegambia, which is probably owing to the king, whose title is Alamy, being less dependent on the chiefs of the villages and towns. The inhabitants, who are a mixture of Jaloofs, Foolahs, Serrawollies, and Mandingoes, are much occupied in trade and manufactures. The most important places are Boolibany and Fatteconda. East of Bondoo and south of Kajaaga is Bambouk, which is noted for its gold-mines. [BAMBOUK.]

The other states which lie farther east and south in the most elevated part of the mountain-region and between the numerous tributaries of the Senegal, are much less known than those hitherto described. There are probably some of which we have no information at all. The most extensive are Foolado, the antient country of the Foolahs, who however were expelled from it by the Mandingoes, with the towns of Koeena, Keminoom, and Bangassi; Manding, the native country of the Mandingoes, which comprehends the most eastern portion of the mountain-region, and has several mines of gold, with the towns of Sibidooloo and Kamalia; Jallon Kadoo, the uninhabited wilderness which extends between the sources of several branches of the river Senegal; Konkodoo on the Ba Fing, or principal branch of the Senegal, which has some rich mines of gold, with the town of Konkroma; Satadoo, with the capital of the same name; and Dentilla, with the towns of Baniserile and Kirwani, which is inhabited by very intelligent agriculturists, and where there are several smelting-furnaces. On the river Gambia is the petty state of Neola, with the town of Tambacunda; and that of Tenda, with the town of Jallacotta.

It does not appear that there is any large kingdom or state south of the Gambia, with the exception of that of Foota Jallon. This kingdom indeed seems to have acquired a decided superiority in the southern parts of Senegambia, more especially south of the Rio Grande: for as it has subjected the tribe of the Landamas, who inhabit the country between that river and the Nuñez, and rendered it tributary, it may be said that its dominions extend to the very shores of the sea. The principal seat of its power is the well cultivated and populous plains of the elevated table-land of Foota Jallon, where the capital, Timbo, not far from the sources of the Senegal, contains 7000 inhabitants, and several other towns from 3000 to 5000 inhabitants, as Labee: in some places the villages are nearly contiguous to one another. The mountain-ranges which surround these plains are all subject to the sovereign of Foota Jallon, who seems to consider also the wild and uninhabited countries along the upper course of the Gambia, and between it and the Faleme, as belonging to his dominions. How far they extend to the east and south is not exactly known, but they do not appear to reach the banks of the Joliba, nor beyond the principal range of the Kong Mountains. Most of the inhabitants are Foolahs, but in the fastnesses of the mountains there are still some small native tribes of negroes. As the shortest road from the sea-coast to the countries on the upper course of the Joliba or Quorra is that which traverses this table-land, Foota Jallon will probably rise to some importance with the extension of European commerce. It seems that a regular commercial connection already exists between it and our settlements at Sierra Leone. [SIERRA LEONE.] In the country which extends between Foota Jallon and the coast, there does not seem to be any political society which deserves the denomination of a state. Each village appears to have a chief, but there is no political connection among the villages.

European Settlements and their Trade.—The European settlements in Senegambia differ materially from those in other parts of the world. They are strictly commercial. The settlers have not acquired the property of any land, except the place on which they have settled, and no cultivation is carried on by them or their people, except at a few spots which are rather gardens than plantations. These settlements were originally established for the purpose of procuring negro slaves for the plantations in America. The country however had other productions which were valued in Europe, and the natives of the interior were desirous of obtaining several articles of European manufacture, partly for their own consumption and partly to sell them to the nations of Soodan. Accordingly these settlements were not abandoned on the abolition of the slave-trade, like those on the coast of Guinea [GUINEA], and they continue in a thriving state. Each of the three European nations which have formed settlements has taken possession as it were of one of the three large rivers, the French of the Senegal, the English of the Gambia, and the Portuguese of the Rio Grande. Each has built a fortress on an island not far from the mouth of the river, which serves as a safe place of deposit for goods which are imported, and from which the productions of the country are shipped. The merchants set out from these places in large river boats with their goods at certain seasons of the year, and ascend the rivers as far as they are navigable. They stop at certain points to which the natives bring their productions to exchange for European manufactures. In a few positions on the banks of the rivers small fortresses or blockhouses are erected, in which some black soldiers with two or three European officers are kept for the protection of commerce. Some merchants, particularly English and Portuguese, have formed commercial establishments not far from these fortresses in those villages which are advantageously situated for commerce.

The principal French settlement is St. Louis, a town containing about 15,000 inhabitants, of whom about 800 are whites. It is built on a sandy island, about two miles long and a quarter of a mile wide on an average, which is about five miles from the mouth of the river. Only vessels drawing less than 12 feet of water can sail up to the town, as there is a bar across the mouth of the river. [SENEGAL.] The streets are straight and regular, but otherwise the town has nothing remarkable in it; few of the houses are well built, and the negro population live in huts. The French have also two small fortresses on the banks of the Senegal, one at Podhor, at the western extremity of the island of Morfil [SENEGAL], and the other at Bakel, or Baquelle, in the kingdom of Lower Galam, not far from the junction of the Faleme with the Senegal. Between Podhor and St. Louis there are several places to which the Moors of the tribes of the Trarza and Braknas bring at certain seasons the gum which they collect in the mimosa forests of the south-western districts of the Sahara. Such places are called markets, and are only inhabited during the stay of the Moors. The most frequented are the Escale du Désert and the Escale du Coq, or Braknas. At Bakel the French get a part of the produce of the gold-mines of Bambouk and some ivory which is obtained in the wild countries farther south, but the largest part of the ivory is carried to the Gambia. The French have also a fortress on the island of Goree, near Cape Verde [GOREE], where they formerly procured a considerable number of slaves. At present some small quantities of cotton and indigo are got on the coast between Goree and the mouth of the Gambia, especially at Albreda, a mercantile settlement in the kingdom of Barra. The French have lately formed an establishment at the mouth of the river Casamanza, which enters the sea between the Gambia and the Rio Grande, but we have no information respecting this place and its trade.

The English settlements are principally on the Gambia. Some English merchants have formed establishments on the river Nuñez at three places, which however are not protected by government. The Foolahs from Foota Jallon and its neighbourhood bring to these settlements gold in the form of rings, weighing from one to ten ounces each, ivory, some slight articles of leather, pouches, rice, and fruit. The principal fortress on the Gambia is Bathurst on the island of St. Mary [BATHURST, vol. iv., p. 38], but there are several mercantile settlements farther inland up to Macarthy Island, which is about 180 miles in a straight line from Bathurst, where a small fortress called Fort George has been erected. A mercantile settlement is found still farther east at Kayaye, and formerly one existed at Pisania, but it has been abandoned. Fort St. James is about 20 miles east of Bathurst. It does not seem that the British settlements have suffered by the abolition of the slave-trade. The exports from Bathurst are numerous and increasing: they consist of bees'-wax, ivory, African teak, rice and maize, hides, gold, ginger, gum, palm-oil, timber, horses and bullocks, which go to the West Indies, tortoise-shell, bullocks' horns, ground-nuts and orchil.

The Portuguese settlements are dispersed along the banks of the different arms of the Rio Grande and on the Casamanza. The principal settlement is Bissao, a well-built fort and town on a large and fertile island of the Jeba branch of the Rio Grande. It has about 3000 inhabitants and an excellent and spacious port; the population consists chiefly of mulattoes and blacks. Higher up the same branch of the Rio Grande is Jeba, with a population short of 1000 inhabitants, which likewise consists of blacks and mulattoes. On the southern branch of the Rio Grande is Bolola, a mercantile establishment, and on the northern or Cacheo branch the town of Cacheo, a considerable place with a harbour, which however is only accessible to vessels drawing ten feet of water, as a bar runs across the mouth of the river. In the country of the Feloops, between the Cacheo branch of the Rio Grande and the Gambia, the Portuguese have several settlements, as at Zinghinchor and Mahia Kakonda on the Casamanza river, and at Vintang on a small river which falls into the Gambia. To all these places the natives bring ivory, wax, hides, horns, and some gold, the greater part of which is shipped to England from Bissao and Cacheo. Many Portuguese have settled in this country as agriculturists and have married black women. The number of mulattoes in these parts is considerable.

Nearly all the articles of commerce which are exported from the European settlements in Sengambia are brought from the interior by small caravans or cafilas, which sometimes proceed to the coast, but generally stop at certain places where commercial establishments are found, and take in exchange for their goods, fire-arms, powder, India goods, coral, amber, glass-beads, iron, tobacco, rum, and cutlery. Though a great part of Senegambia is rich in iron-ore, the process of obtaining the metal from it is so rude and requires so much labour, that many of the natives prefer buying it from Europeans.

Commerce with Soodan and Timbuctoo.—A considerable commerce is carried on between Senegambia and the countries farther east. The principal articles of trade are salt, slaves, and gold. All the salt which is consumed in Senegambia and Soodan is drawn either from the great salt depôts of the Sahara at Shingarin and Toudeni, or from the coast of the Atlantic between the mouths of the Gambia and Cape Verga, where some of the savage tribes, especially the Bagoes and Balantes, make large quantities from sea-water. The salt made on the sea-coast is carried by the native traders nearly over all Senegambia; for Mungo Park observes, that both kinds of salt are brought to Booree in Manding, but it would seem that the salt of the Sahara is consumed in some of the countries situated on the middle course of the Senegal. Even before the abolition of the slave-trade slaves were sent from Senegambia to Timbuctoo, whence they found their way to the northern countries of Africa; and it is supposed that this branch of commerce has lately much increased. A large portion of the gold collected in the countries situated on the banks of the upper branches of the Senegal goes likewise to Timbuctoo, and thence to the countries on the south of the Mediterranean. The cafilas by which this commerce is carried on follow two routes. The most northern departs from the Senegal in the kingdom of Kajaaga or Upper Galam, to which country the traders go from all parts of Senegambia. Hence the road runs east-north-east to Yarra, and then east to Benown in Ludamar. From Benown it continues east through countries which are little inhabited on account of their sterility, to Walet in Beroo. From Walet it again passes through deserts, until it approaches the Joliba near Baracanga, whence it continues at a short distance from the banks of the river to Timbuctoo. The southern caravan-route leads from the banks of the Gambia through Neola, Dentila, and Konkodoo, to the great wilderness of Jallon Kadoo, which having traversed from west to east, it passes over the mountain-range between Kamalia and Bammakoo. At Bammakoo the goods are embarked on the Joliba, and descend to Yamina, Sego, Sansanding, Jenneh, and Timbuctoo.

(Golberry's *Travels in Africa*; Mungo Park's *Travels in the Interior Districts of Africa*; Mollien's *Travels in Africa to the Sources of the Senegal and Gambia*; Gray's and Dochard's *Travels in Western Africa*; Caillié's *Travels through Central Africa to Timbuctoo*; Savigny's and Corréard's *Narrative of a Voyage to Senegal*; Owen's *Narrative of Voyages to explore the Shores of Africa, Arabia, and Madagascar*; Belcher's *Extracts from Observations on various points of the West Coast of Africa*, in *London Geogr. Journal*, vol. ii.; Hay's *Supposed Junction of the Rivers Gambia and Casamanza*, in *London Geogr Journal*, vol. iii.; *Proceedings of the Association for Promoting the Discovery of the Interior Parts of Africa*; Brunner, *Reise nach Senegambia*, Bern, 1840.)

SENESCHAL, a word rarely used except by persons who affect a kind of refinement of style which they think is attained by using words of exotic growth rather than words the natural growth of their own soil, the meaning being precisely that which is represented by the word 'steward;' and this when the word is applied to officers so designated of the greatest eminence; the lord-high-steward of England or of Scotland being the proper phrase for that great officer, and not lord-high-seneschal. But the functions of the officer called steward in Britain corresponding with those of the officer called seneschal abroad, and especially in France, when the word appears in Latin, it is represented by *senescallus*, writs running 'Senescallo Hospitii Regis,' &c., when addressed to the steward. In poetry and romance-writing it is sometimes used for a principal officer in the household of distinguished persons, when it is thought that the word steward would be too familiar, and suggest an officer whose duties are of an inferior class to those of the seneschal.

SENLIS, a town in the department of Oise in France, 26 miles from Paris on the road to Cambray and Mons. This town was the capital of the Silvanectes, an antient Belgic nation, and received from the Romans the name of Augustomagus, which towards the close of the Roman period was exchanged for the name of the people, Silvanectes, whence by corruption the modern name of Senlis. It was at this period a walled town, and some remains of the walls still exist. The Carlovingian kings had a palace at Senlis. In the middle ages it gave title to a county held by a branch of the Carlovingian family, and sometimes united with the counties of Valois and Vermandois, and afterwards united to the crown. In A.D. 1173 the municipality of Senlis was established by charter, and confirmed, A.D. 1201, by letters of Philippe Auguste. The town was taken by the peasantry of Valois in the revolt of the Jacquerie in the fourteenth century; and by the Bourguignons in the civil broils of the fifteenth. In A.D. 1418 it was besieged in vain by the Armagnacs; but surrendered to Charles VII., A.D. 1429. It was repeatedly attacked, sometimes successfully, by the opposite parties in the war of the League.

Senlis is on the slope of a hill rising from the north bank of the Nonette, a feeder of the Oise: it consists of the city (La Cité), of an oval form, surrounded by boulevards and the remains of antient fortifications, and three suburbs. The remains of the fortifications, consisting chiefly of the ruins of the two gates of Meaux and Bellon, and of the castle, show the place to have been very strong. The streets are generally narrow and crooked, and the houses ill-built. One street, which traverses the town in a north-east direction, is wide and straight, but is lined chiefly with garden walls. There are some pleasant promenades. The ex-cathedral is a Gothic building of moderate size, of the age of Louis XII. It has two western towers, one of them crowned with a spire, 224 feet high according to some authorities, or about 284 according to others. There are a college, a handsome theatre, public baths, an hospital, and an ex-abbey, now used as a cotton-mill.

The population in 1831 was 5066, in 1836 it was 5016. The chief manufactures are of cotton and woollen yarn, calico, linen, lace, leather, glove-leather, parchment, potato-starch, chicory, and chocolate. There are bleach-grounds for linen, washing-places for wool, saw-mills for marble and other stone, a large stereotype printing-office, employing 200 men (Dupin, *Forces Product.*), and a letter-foundry. There is one yearly fair of nine days, and a monthly market for wine. Trade is carried on in corn, flour, wine, timber, and stone. There are stone-quarries and extensive woods near the town, and sand-pits for the sand used in making flint-glass; there are also some lime-kilns.

The arrondissement of Senlis comprehends an area of 511 square miles, and includes 132 communes. It is divided into seven cantons or districts, each under a justice of the peace. The population in 1831 was 79,080, in 1836 it was 78,790.

SENNA. [CASSIA.]

SENNA is a country on the eastern coast of Africa, and a portion of that region which on our maps is called Monomotapa, and has acquired some fame on account of the rich mines of gold which it contains. It is situated between 16° and 20° S. lat., and between 30° and 37° E. long., and is stated to cover a surface of 43,200 square miles, being only about 7000 square miles less than England. It forms the capitancy of the Rios de Senna, the only territory that the Portuguese really possess on the east coast of Africa, their other possessions, as Mozambique, Pemba, &c., consisting only of fortified towns, to which no territory or only a very small territory is annexed. This capitancy is bounded on the east by the sea, on the south by the mountains of Sofala, and it extends to the kingdoms of Quiteve and Barne, which enclose it on the west. To the north of it is the independent kingdom of Moraves, from which it is chiefly separated by the course of the river Zambizi.

The shores of Senna are low, and continue so for some distance inland, but the country gradually rises as we proceed westward. At the distance of 150 to 180 miles from the sea there are some ranges, which do not appear to rise to a great height. They seem to run parallel to the coast, and to be divided into two ranges by the wide plain of Senna, through which the Zambizi runs. A great part of the country west of these ranges appears also to be a plain, the surface of which however is hilly. In approaching the western boundary near 30° E. long. the country is covered with mountains.

Senna is well watered; numerous small rivers descend from the adjacent mountains, all of which join the Zambizi. This river, whose course probably exceeds 800 miles, originates in the countries west of Senna, of which we have no account. Its upper course within Senna is from south-south-west to north-north-east, but it gradually turns more to the east. It is not known where it becomes navigable, but it is certain that from the town of Teté downwards it is navigated, though the navigation is very tedious in the wet season owing to the rapidity of the current, and in the dry season on account of the numerous shoals and the deficiency of water. Above Teté the Zambizi enters the flat country, but it runs between high rocky banks until it enters the low country at the distance of about 50 miles from the sea in a straight line. In the low country it divides into two branches at Marooro, of which the northern is called the river Quilimane, and the southern Luabo, and both branches are navigable. A large branch separates from the Luabo not far from the place of division, and bisects the delta of the Zambizi, falling into the sea at nearly an equal distance from the mouths of the Quilimane and Luabo. It is called the Melambey, from a place near its mouth. The embouchures of the Luabo and Quilimane are about 60 miles from one another. Where these rivers flow through the level tract, they form a great number of islands, which in some places are so numerous as to constitute an archipelago, and by which the volume of water brought down by the river is divided into numerous narrow channels, in which the current running with great velocity renders the navigation laborious.

The delta of the Zambizi and the low country near the sea consist of a flat, which is marshy and covered with mangroves to low-water mark. Higher up the banks are more elevated, the ground is cleared to a greater extent, and the country abounds in villages: but towards the place where the river divides into arms, nearly the whole surface of the country is covered with rushes and bamboos, interspersed with extensive swamps, which during the rainy season send up pestilent vapours. A few isolated trees, a species of palm, are scattered over this unwholesome waste. The more elevated part of the country, about the town of Senna and higher up the river, is an extensive plain, which descends towards the banks of the river with a gentle slope. It is chiefly covered with a forest consisting of a great variety of trees, which are united by creeping plants climbing and hanging from branch to branch in festoons. In some places these trees are of a vigorous growth, but in general they are stunted.

The year is divided between the rainy and the dry season. The rains commence in the beginning of November, and continue to the end of March. They are very abundant, especially in the beginning of the wet season. The river soon rises above its banks, and inundates the contiguous country to the distance of several miles inland. During this period the heat is very oppressive, but not unwholesome in the higher parts of the country, except in the vicinity of lakes.

The cultivated grains are rice, maize, millet, and wheat. The sugar-cane was introduced some time ago, and seems to succeed well. Coffee is grown in the more elevated country. Indigo grows wild, as well as the cotton-shrub, which produces cotton of a very fine quality. The latter is cultivated by the blacks, but only for home consumption. It is stated that in some parts of the colony a deep scarlet-coloured cotton is produced. Vegetables are grown in considerable quantities, consisting of cabbages, lettuces, spinach, peas and beans, potatoes, yams, and ground-nuts. A kind of grass is cultivated as food. Before it is quite ripe, it is plucked, dried, and husked in a large wooden mortar, and then ground between two rough stones. The meal thus obtained is made into a porridge, which is generally eaten with fish. The fruit-trees are only tamarinds, oranges, cocoa-nuts, palms, and mango-trees. Among the forest-trees is a species of cotton-tree, of a gigantic size, frequently measuring sixty feet in circumference. The wood is used for canoes in preference to any other, as not being subject to the attack of worms. Large boats fifty feet long are made of a single tree hollowed out.

The wild animals are elephants, rhinoceroses, lions, hippopotami, alligators, monkeys, and deer; but there are probably many others, which have been overlooked by the few persons who have visited this country. There are the common domestic animals. In Owen's 'Narrative' tiger-skins are mentioned as one of the articles of export. Fish is very plentiful in the river, and constitutes one of the principal articles of food of the negro population. Bees are very common, and wax is an article of export.

Gold and iron are the only metals which are known to exist in abundance. Gold is chiefly found in the mountains of Sofala, and in those which surround the colony on the west; and it does not appear that this article is brought from the kingdom of Moraves, but it is obtained in those of Quiteve and Barne. Iron is obtained in abundance from the southern districts of the colony, and also from the kingdom of Moraves: the hoes with which the slaves till the ground are made of it. Marble is got in the hills which run parallel to the coast. The population consists of a few Portuguese and mulattoes, and a great number of blacks. According to the statement of the governor of Rios de Senna, the number of the whites and mulattoes in 1810 did not exceed 500. The negroes are partly free and partly slaves of the whites and mulattoes. It is not stated whether they belong to one or more tribes, nor whether they speak one or more languages. The colony is divided into several districts. Every district is governed by a Portuguese, who pays annually a small tax to the king, and collects a revenue from the free negroes resident on his land. These negroes pay the taxes in kind, consisting of bees'-wax, fowls, meat, vegetables, and rice.

The only harbour in the colony which is visited by vessels is that of Quilimane, about eight miles from the sea, on the northern arm of the Zambizi. [MOZAMBIQUE, vol. xv. 766.] The town of Senna, the capital of the colony, stands in a plain on the banks of the Zambizi, about 180 miles from the sea, measured along the bends of the river. Only about ten houses, inhabited by the Portuguese, have any pretensions to the style of European buildings: the black population live in huts. The number of inhabitants probably does not exceed 3000. A small part of the plain is cultivated; and the remainder is covered with a forest of tamarind, mango, and cocoa-nut trees. The largest place seems to be Teté, which is about 360 miles from the mouth of the Zambizi. It is described as superior, both in size and situation, to Senna and Quilimane, and stands in a mountainous tract, with the river flowing beneath: it is considered a very healthy place; and the inhabitants are a very active and industrious set of people: they cultivate the sugar-cane, and make sugar and muscovado.

This colony might become an opulent and commercial country; but it has been neglected by the government, and the inhabitants have not availed themselves of its fertile soil and its numerous and valuable productions. The few articles of export are those which may be obtained nearly without labour. They consist of the teeth of the hippopotamus, elephants' tusks, rhinoceros-horns, tiger-skins, honey, wax, and gold-dust. The imports, of which the greater part are sent into the interior for the purchase of gold, ivory, and slaves, are as follow: cotton stuffs of various qualities, coloured and plain, woollens and silks, millstones, false coral, large white and metal beads, pewter, gunpowder, arms, earthenware, brandy, wine, liquors, sugar, soap, salt-meat, butter, oil, pitch, lavender, salt-fish, spices, olives, tea, coffee, and chocolate. Many of these articles answer the purposes of money.

When Vasco de Gama entered the Quilimane branch of the Zambizi, he found a great number of Arabs in the country. The Portuguese seem to have taken possession of the coast about the middle of the sixteenth century; and having obtained some account of the great abundance of gold in the interior, Francisco Barreta penetrated, in [illegible], as far inland as Teté. To protect the commerce which was eventually opened by this expedition, various forts and strongholds were erected on the banks of the Zambizi and its dependent rivers, to awe the surrounding tribes. The most important advantages that Portugal derived from this possession was an abundant supply of slaves for the Brasil market. (Owen's *Narrative of Voyages to explore the Shores of Africa, Arabia, and Madagascar.*)

had were sticks, shields, and spears of a rude construction They are very expert at killing the crocodile and hippopotamus with the same spears which they use for self-defence. They speak a language different from that of their neighbours, but nothing is known about it. They wear no covering, and worship the sun and moon. Their sovereign is said to reside on an island of the Bahr-el-Abiad, called Abba. Opposite the Shillúks, on the eastern banks of the Bahr-el-Abiad, live the Denka, who were originally the same nation, but they are now quite distinct, and constantly at war. The principal wealth of both nations consists of cattle.

The peninsula of Atbara is the residence of two powerful tribes, the Bisharies, or Bishareen, and the Shukerieh. The former occupy the northern portion of the country. [BISHAREEN.] The Shukerieh are handsome men, with fine countenances, tall, and not black. They are proud, but more polished and less debauched than the Bisharies. They do not speak Arabic, but we are not informed whether their language has a resemblance to that of the Bisharies. Though these two tribes derive their subsistence chiefly from the produce of their herds of camels, cattle, sheep, and goats, they repair to the banks of the Atbara immediately after the inundation to sow dhourra, and remain there till the harvest is gathered in. During the hottest part of the summer, when the grass is dried up in the desert, they again descend to feed their cattle on the herbage on the borders of the stream. It appears that a small tribe of the nation of the Adindoas, or, as Burckhardt calls them, of the Hadendoa, who live on the east of the Atbara river, has settled west of that river, in the vicinity of Gous Regeip. They are also a nomadic nation, but occasionally cultivate dhourra. These tribes are not subject to the Egyptian government.

Government.—The pasha of Egypt maintains a regiment of infantry, consisting of 4000 men, and two regiments of Turkish cavalry, each of 400 men, in Beléd-es-Soodán, and governs the province by a sandjar, who resides in the town of Kartoun. But only a small portion of the country is immediately subject to the governor, nearly the whole being under the authority of native sheicks, who annually pay the governor a fixed sum of money. The territories of some of these sheicks are very extensive.

Towns.—The most populous place at present is Kartoun, situated at the confluence of the two great branches of the Nile. Though it is not yet 20 years since it was a miserable village, it had a population of 15,000 four or five years ago, in consequence of being fixed upon as the residence of the governor. The houses are built partly of sun-dried bricks and partly of dhourra-stalks. The former capital was Sennaar, which contained a population of from 10,000 to 12,000 individuals. The town was destroyed when the Egyptians occupied the country in 1822, and in 1829 it consisted of a heap of ruins, except a few houses which were inhabited by some merchants. But in 1837 it appears that nearly the whole town had been rebuilt, and that the inhabitants had resumed their manufacturing industry. Among the manufactures which were offered to Holroyd were mats with beautiful devices made of split doum-leaves, and dyed of various colours, conical straw covers for plates in elegant patterns, silver stands for coffee-cups in filagree, warlike weapons, as spears, knives, &c., and amulets, which are worn for security from every kind of disease and casualty. There is a well-furnished bazar. Wady-Medinah and Missalemieh, between Sennaar and Kartoun, carry on some commerce with the adjacent county. No place on the Bahr-el-Abiad has risen into importance. At Monkárah are the dockyards on which annually about 30 boats are built for the pasha of Egypt, but it contains no inhabitants except the workmen employed in their construction. In the interior and within the mountain-region of Jebel Fungi is the town of Goleh, which is said to be equal in size to Sennaar, and to be noted for its iron-ware.

Manufactures.—That branch of industry in which the Sennaarese are most distinguished is leather, which is of the best quality, and much superior to that made in Egypt or Syria. This leather however is not frequently exported, but worked into different articles, which have an extensive sale in the valley of the Nile and in Arabia. The most important of these articles are camel saddles, sandals, and leathern sacks. The camel saddles are of elegant and durable workmanship, ornamented with many pretty leathern tassels. They are exported to Egypt for the dromedaries or riding-camels, and sell at a high price. The Sennaar sandals are worn by all well-dressed men and women throughout Nubia. They are made with a neatness which surprises all foreigners. They generally sell for two Spanish dollars the pair. The leathern sacks are of two kinds. The large water-skins called reys are made of ox-hides, and are used by the caravans for transporting water through the desert. They keep the water much better than the smaller goats'-skins, and the thickness of the leather prevents it from evaporating so readily. The goats'-skins made in Kordofan are much valued, as they have no seam, while the common ones are sewed up on three sides. Another kind of leathern sacks is exported from Sennaar to Suakim, and thence to Arabia, especially Yemen, where they are used for carrying provisions in travelling. Minor articles of leather, which are articles of commerce, are water-flasks, which are much esteemed in Egypt, whips, and ropes. Where dates grow, cords and ropes are made of the fibrous interior bark of the palm date-tree, and in some places of reeds. The shields made of the skins of the rhinoceros and giraffe are used all along the Nile and across the mountains as far as Cosseir and Kenneh in Upper Egypt.

Cotton-cloth is made by the women for domestic use, but it constitutes also a considerable article of trade in Northern Africa, under the name of damour. The workers in gold, silver and iron are very skilful, and execute their work neatly with very simple tools. Pottery is made to a considerable extent in Sennaar; in Kordofan are made large wooden dishes or bowls, which are carved out of the root of some trees; they are rubbed with butter, and then held over the fire to give them a black colour. The bowls are placed along the walls of the sitting-rooms as ornaments. They are very nicely worked, and it is impossible to observe the smallest trace of the instrument with which they are made. In some places coloured straw-hats are made with great neatness, and they are sent to different countries in the neighbourhood.

Commerce.—The province of Beléd-es-Soodán is the seat of an extensive commerce. Its commercial relations with the interior of Africa extend as far as Begharmi, which is situated much nearer to the Bight of Benin than to the Red Sea, and nevertheless receives some articles, especially the spices of India, by the way of Shendy in Nubia, or by Sennaar. The caravans which depart from these places go as far as Cairo. Numerous pilgrims from the interior of Africa pass through Shendy and Sennaar on their road to Suakim on the Red Sea, and by the same way many products of the country and of the interior of Africa are sent to the coasts of Arabia, where they are partly exchanged for the goods brought from Hindustan and the Indian Archipelago, while European goods reach Abyssinia and the eastern countries of Soodan by the way of Egypt. As the merchants who carry on this extensive commerce are obliged to pass through countries inhabited by nomadic and predatory tribes, they unite for their security in caravans, and always follow certain roads.

Two caravan-routes lead to the port of Suakim on the Red Sea; one from Sennaar, and the other from Shendy. The route beginning at Sennaar follows the course of the Bahr-el-Azrek to its confluence with the Rahad river, then stretches across the peninsula of Atbara in a north-east direction to Gous Regeip on the river Atbara. East of the river its direction is east-north-east, until it strikes the southern extremity of the mountain-range called Jebel Dyaab, when it turns north-north-west, and running at a short distance from the eastern base of the mountains, joins the Red Sea at Suakim. The caravan-route which begins at Shendy follows the banks of the Nile to the village of Kaboushye, a distance of about 30 miles, and then strikes across a desert portion of the peninsula of Atbara in an east-north-east direction to the village of Atbara on the river of the same name. Afterwards it runs more to the east, and traverses the hilly region called Langay and the range of the Jebel Dyaak not far from Suakim.

The great caravan road from Shendy to Cairo follows the course of the Nile as far as Berber (18° N. lat.), whence it runs nearly in a due north direction through the desert country east of the river, crosses the range called Jebel Shigre near 21° N. lat., and again approaches the Nile near 23° N. lat., but reaches its banks only at the village of Daraou, about ten miles north of Assouan, on the east bank of the river. At this place the caravan-road terminates, and the goods are embarked in boats to be conveyed to Cairo and other places of Egypt.

The common route between Shendy and Sennaar lies along the banks of the Nile and the Bahr-el-Azrek, but there is a shorter road through the desert, which runs nearly due south from Shendy to Abouharras at the confluence of the Bahr-el-Azrek with the Rahad.

Two caravan-roads lead from Sennaar to El-Obeïd in Kordofan. The northern crosses the Bahr-el-Abiad at Monkarah, and the southern at Aleïs, the most northern place inhabited by the Shillúks. From El-Obeïd the route passes westward to El-Tusher, the present capital of Dar-Fur, and thence to Kobbe and Kubkabiyah. Sometimes the caravans from El-Obeïd and Kobbe do not go to Sennaar or Shendy but proceed across the desert west of the Bahr-el-Abiad and the Nile to the banks of the Nile at Debba, nearly opposite the ruins of old Dongola (18° N. lat.).

The common commercial road from Sennaar to Gondar in Abyssinia runs in an east-south-eastern direction to Ras-el-Fil, where the merchants of both countries meet and exchange their goods.

Few of the articles imported into Sennaar are brought from European markets. The principal articles imported from Egypt are the sembil and mehleb, both of which are in great request in Soodan; the former as a perfume and medicine, and the latter as a condiment. The sembil is the Valoria celtica or Spiga celtica of the Italians, and is chiefly grown in the southern provinces of the Austrian dominions; it is sent from Venice and Trieste to Alexandria. The mehleb is brought from Armenia and Persia, and shipped at Smyrna and other ports of Asia Minor for Egypt. It appears to be the fruit of a tilia. These two articles are also imported into Massowah from Jidda for the Abyssinian market. Sugar is brought from Upper Egypt, and soap from Syria, where it is manufactured. From Egypt are also imported many manufactured articles, as takas, a sort of coarse cambric dyed blue, white cotton stuffs with red borders, made at Mehalla in the Delta, melayes, a blue striped cotton cloth, linen made at Siout and Manfaloot, and sheepskins dressed with the wool on, which are often dyed blue and red, and are used as saddle-cloths for the horses, dromedaries, and asses of the natives, and as carpets for the women's apartments. European manufactures are not regularly imported, though some scarlet cloth, velvet, satin, and gold-embordered stuffs of the lighter kind from Lyon and Florence, and a variety of English calicoes or cambrics, are occasionally in request. Beads are a considerable article of import. The most common are small wooden beads, made by the turners of Upper Egypt; others are made of the kernels of the doum-tree, of which the chief manufactory is at Denderah in Upper Egypt. A variety of beads of a red and blue colour are brought from Jerusalem. The better sort of glass beads are sent from Venice, but the greater part are made at El-Khalil near Jerusalem, where there are extensive glass-houses. A kind of beads called reysh are brought from Suakim to Sennaar; they come from the East Indies, principally from Surat, and are perforated balls of coloured agate, of the size of a small cherry; they are in great request all over Eastern Africa, especially in Dar-Fur, Dar-Zaleh, and Borgho, where they fetch a high price. The reysh are worn as necklaces by the women. Coral of an inferior kind, false coral made in Venice, and transparent amber are sold in small quantities. Paper, made in Genoa and Leghorn, goes to Dar-Fur and other countries farther west. Yellow brass-wire is in great demand, as it is used for ornamenting the lances by twisting it round different parts of the shaft. Old copper, principally large boilers and pots, are much in request; pewter in thin bars is sold in small quantity. Of hardware the most saleable articles are common razors, files, thimbles, scissors, needles, nails, steels to strike fire with, and sword-blades. The sword-blades are made at Solingen on the Rhine. Tar is imported to make the water-skins waterproof, and to rub the backs of the camels. Silver trinkets for female ornaments, such as bracelets and ear-rings, are imported in great numbers; most of them go to Dar-Fur. Small bells to ornament the bridles and halters of the camels are also imported from Egypt. Looking-glasses of Venetian and Trieste manufacture, with gilt covers, are a considerable article in the Egyptian trade: the most common kind are about four inches square; others, which are round and of about the same size, are made in Cairo. No woman marries without decorating her room with such a looking-glass. Among the imports from Egypt are Spanish dollars.

The principal article of export is slaves. They are partly imported into Sennaar from Abyssinia, Kordofan, and Dar-Fur, and partly taken from the mowelled, or native slaves of the country. The Abyssinians are the most valued for beauty and fidelity, but they are not so strong as the others. The next in estimation for beauty are the mowelled, but they have not a good character for honesty. The slaves from the Nuba mountains and those from Dar-Fur are perfect negroes, not good looking, but honest and faithful. Children and young females are sold at the highest price, often for 100 dollars each. The second article is the damour, or cotton-stuff, which is always in great demand, as the cotton manufactories of Sennaar and those of Begharmi furnish the greater part of north-eastern Africa with articles of dress. The third article in importance seems to be gold, which is partly got from the mines in the Fungi and Nuba mountains, and partly from Abyssinia. The principal market for gold in Abyssinia is Ras-el-Fil, nearly half-way between Sennaar and Gondar. The gold is principally bought by the Suakim traders, who carry it to Jidda, where it is given in payment for Indian goods. Other important articles of export are ivory, mostly from Dar-Fur, rhinoceros horns, musk, whips and other articles of leather, ebony, the coffee brought from the western districts of Abyssinia, honey, and ostrich feathers. Minor articles, mostly brought from Kordofan, are gum-arabic of the best quality, tamarinds, gum-leban, natron from Dar-Fur, sheshme, a seed used in Egypt for diseases of the eyes, and shooshe, a small pea of Kordofan and Dar-Fur growth.

India goods reach Sennaar by the way of Jidda and Suakim. They consist of different sorts of cambric from Surat and Madras, of coarse muslins from Bengal, of spices, especially cloves and ginger, of India sugar, the beads called reysh, and sandal-wood. A part of all these articles passes farther west to Dar-Fur, Dar-Zaleh, and Begharmi. Besides gloves, gold, and other articles, the merchants from Suakim export a great number of horses of the Dongola breed, and tobacco, which two articles find a ready sale in Yemen, at Hodeida, Loheiha, and as far south as Mocha.

The inland trade of Sennaar is very active, partly in consequence of the great number of caravans which continually traverse the country, and create a great demand for camels, which are brought to those places through which the caravans pass, and partly on account of the different productions of the several parts which constitute the province of Beled-es-Soodán. There are always considerable caravans on the roads conveying dhourra from Sennaar to those parts which are less fertile, or where the cultivation of the ground is less attended to.

No gold currency is in use among the merchants of Sennaar except unstamped pieces or rings of pure gold. They are of different sizes from 30 paras (2*d.*) to 240 piastres (3*l.*); and during the whole time the market lasts, an officer sits with the scales before him, and weighs gold gratis for all persons. Spanish dollars are current. The inhabitants of Kordofan make an iron money from the ore which is obtained in the desert between the Bahr-el-Abiad and Kordofan. This money resembles the section of a mushroom, is made without any reference to weight, and each piece passes for one para, forty being equal to one Turkish piastre, which, according to its present rate of exchange, is equal to 2½*d.* sterling. In some parts the beads are used as small coin. In some towns all money transactions are made in reals, an imaginary coin, equal in value to 15 piastres.

History.—The antient history of Sennaar is very little known. It appears that it once formed a part of the empire of Abyssinia, and at a later period of Nubia. In the thirteenth or fourteenth century it was wrested from Nubia by a family which came originally from Teysafaan, a country in Soodán; and at one time that family was in possession of nearly all Nubia, the whole country from the second cataract to the mountains of Fungi being subject to them. On the east their empire included Suakim and a large tract of the coast of the Red Sea, and on the west it extended beyond Kordofan. In the course of time the sovereigns, called *muks*, became too indolent to transact business, and appointed a vizier, who soon possessed himself of all the power, though he continued to pay outward respect to the muk. This took place about 200 years ago, and since that time the power of Sennaar has been decreasing, and several chiefs have become nominally and really independent. In 1822 the country was invaded by the army of Mohamed Ali under Ismael Pasha. The vizier made no resistance, but obtained good terms for himself, by which the southern part of Sennaar, which lies within the mountains of Fungi, was left to him as a vassal of the pasha of Egypt, and the muk was reduced to the station of a private individual. As already observed, the Shillúks on the banks of the Bahr-el-Abiad have submitted to the pasha, which was effected by the annual military expeditions that the pasha's governor sent to that country for the purpose of seizing the inhabitants as slaves.

(Burckbardt's *Travels in Nubia;* Linant, 'Voyage on the Bahr-el-Abiad,' in *London Geogr. Journal*, vol. ii.; Lord Prudhoe's 'Journey from Cairo to Sennaar,' in *London Geogr. Journal*, vol. v.; and Holroyd's 'Notes on a Journey to Kordofán,' in *London Geogr. Journal*, vol. ix.)

SENNERTUS, DANIEL, was born at Breslau in 1572. In 1601 he took the degree of Doctor of Medicine at Würtemberg, and in the following year was elected professor there. He died of the plague in 1637. During his life, and for many years after, Sennertus enjoyed the highest possible reputation as a learned and skilful physician. His works, which are very numerous and long, prove him to have been a skilful compiler from those of others. He was the first to endeavour to reconcile the then modern doctrines of Paracelsus with the antient ones of Galen, which they had well-nigh overturned; snd he appears to have been much less credulous than most of his contemporaries on the subjects of alchemy, the universal remedy, and others of the like kind. The whole works of Sennertus were published in fol. at Venice in 1645, and in subsequent years at Paris and Lyon.

SENS, a town in France, in the department of Yonne, 67 miles south-east of Paris, on the road to Lyon. This town existed at the time of the Roman conquest, and is mentioned by Cæsar under the name of Agendicum. Ptolemy writes it 'Αγηδικόν; and in the Antonine Itinerary it is Agedincum. It was afterwards called Senones from the name of the people to whom it belonged, and from thence is derived the modern Sens. Some antiquaries dispute the identity of Agedincum with Senones, and contend for the former being on the site of the modern Provins [Seine et Marne]; but this opinion does not appear to be well sustained. Agedincum or Senones became under the Romans the chief town of Lugdunensis Quarta, or Senonia. It became at an early period the seat of a bishopric, and afterwards of an archbishopric. In the middle ages it was the capital of a county, which was united to the crown by the kings Robert and Henri I.

The town, properly so called, is of an oval form, surrounded by walls now partly destroyed. The foundations of these walls are of large stones, five feet long and three or four feet thick, rising to unequal heights above the soil. Upon these is raised the upper part of the walls, faced with small stones four or five inches square, varied with triple courses of brick. Some of the large stones of the foundation bear Roman inscriptions or fragments of sculpture. There are traces of Roman roads leading from Sens in various directions. Of the nine gates of the city, three belong to the middle ages, and the rest are modern. The streets, with the exception of that through which the Paris and Lyon road passes, are narrow and crooked, and the houses generally ill-built. The town is on the right bank of the Yonne, over which are two bridges: it is near the junction of the Vannes, which flows on the south side of the town, and the waters of which distributed through the streets contribute to their cleanliness. The principal public building is the cathedral, which is a large Gothic structure of various dates, remarkable for the size and general good effect of the nave, and for the height of the tower. The cathedral contains a handsome monument to the Dauphin snd Dauphiness, the parents of Louis XVI., Louis XVIII., and Charles X. The principal modern building is the college. There are public baths, a theatre, an hospital, a seminary for the priesthood, and some pleasant public walks.

The population in 1831 was 9267 for the town, or 9279 for the whole commune; in 1836 it was 9095 for the commune. The chief manufactures are of glove and other leather, cotton-yarn, straw and chip hats, woollen stuffs, polished steel, glue, candles, tin clepsydras or water-clocks, potato-spirit, tiles, and earthenware. There are a bleach-ground for linen, a brewery, and some cinder-mills. The chief trade is in corn and flour for the supply of Paris, wines, wool, hemp, tiles and bricks, bark, leather, tan, timber, &c. There are five yearly fairs. Sens has a public library of 5500 vols., and a museum. There are nursery-grounds in the neighbourhood.

The archbishopric of Sens is now united with that of Auxerre. The department of Yonne constitutes the diocese. The suffragan bishops, with their dioceses, are as follows:—

Sees.		Dioceses.	
Troyes	. .	Department of	Aube.
Nevers	. .	„	Nièvre.
Moulins	. .	„	Allier.

The arrondissement of Sens comprehends an area of 474 square miles, and includes 90 communes. It is divided into six cantons or districts, each under a justice of the peace. The population in 1831 was 60,342; in 1836, 61,036.

SENSATION. [Nervous System.]

SENSES. The senses are the faculties by which we become acquainted with some of the conditions of our own bodies, and with certain properties and states of external things, such as their colour, taste, odour, size, form, density, motion, &c. The senses are five in number, namely, sight, hearing, taste, smell, and touch; and each of them is exercised in the recognition of an impression conveyed along some nerve to the brain. The particular physiology of each is contained in the article devoted to its organ [Eye; Ear; &c.]; here we shall only consider some of the circumstances common to them all.

There are no kinds of sensation produced by external causes which we may not also derive from conditions of the nerves arising independently of such external causes. Thus heat and cold, painful and pleasing sensations, are often felt as the results of internal causes acting on the nerves of touch or common sensation; so also light and various colours are often perceived in the dark; noises seem to be heard in the ears when no sounding body is near; and smells and tastes are sometimes perceived, as if in the nose and mouth, without any external cause from which they can proceed. These facts constitute a part of the proof that that of which the mind is rendered conscious by any of the senses is not the condition of the body said to be perceived, but the condition of the nerve through which the impression is conveyed to the brain; a condition which may result either from internal causes or from the influence of something external.

The same internal cause acting on the organs of the several senses produces, through the medium of each, a sensation peculiar to itself, and similar in kind to that perceived in the exercise of that organ's normal function. Thus a congestion of blood in the retina produces a sensation of flashes or sparks of variously coloured light; one in the expansion of the auditory nerve gives rise to ringing or other sounds in the ear; one in the skin or other part supplied with nerves of common sensation excites itching or pain or heat; and so on. In like manner the same external influence applied to the several kinds of nerves produces through each a peculiar and proper sensation. Thus, when the eye, ear, tongue, nose, and skin are successively electrified, sensations of light, sound, taste, odour, and pain are successively produced; and blows on the ear and surface of the body produce through each a sensation similar in kind to that which it is the proper function of each of those parts to convey.

The senses are exercised therefore in many circumstances besides those by which we are informed of the conditions of external things. The condition of a nerve becomes perceptible whenever it is disturbed from its state of absolute rest; and it is perceived as if it were being acted on by some external influence. The sensations thus produced by internal causes are called *subjective*, and their existence proves not only that by our senses we perceive immediately only the conditions of our nerves, but also that each kind of nerve is capable of communicating only one kind of sensation, which is always, in some form or other, perceived, whatever be the circumstances by which the nerve is disturbed from its state of rest. The optic nerve, for example, gives a sensation of nothing but light, however it may be acted on from without or from within; even severe injuries of it, such as cutting it asunder, produce the appearance of a flash of light, but no pain properly so called (for that which is called a painful sensation of light is very different from pain in any part supplied only by nerves of touch). And in like manner the auditory nerve under no circumstances conveys any sensation but that of a sound. A nerve of one sense therefore can in no case discharge the function of a nerve of any other sense.

We are totally ignorant of what the energetic condition of a nerve consists in, as well as of what it is that renders each nerve peculiarly and properly susceptible of impressions from only one kind of external circumstances, and of what are the causes of the different impressions exercised by different modifications of that one kind of stimulus. For example, we not only cannot tell how heat and light (whose very existence we only learn by our senses) act upon the nerves of the skin and of the eye, but we cannot tell why different kinds of light put the filaments of the optic nerve in such different conditions as to give through them the impressions of different colours, nor why the different temperatures of bodies produce in us the sensations of what we call different degrees of heat and cold. Nor do we know more of the simple action of any other of the senses.

Our ideas of the simple sensible properties of bodies, such as their colour, taste, odour, &c., seem not susceptible of analysis; but this is not the case with the ideas which we obtain, by the exercise of our senses, of some other properties and conditions of external things, such as their size, form, motion, &c.

Our knowledge of the size and form of a body seems to be the result of our appreciating the extent of sensitive surface upon which at any given time it makes its impression. When, for example, anything is touched by the surface of the body, the impression is conveyed by each of all the nervous filaments whose extremities lie within the space of contact; and if the body be small enough to be touched at once in all its parts, we judge of its size by that of the extent of surface over which it is capable of putting our nerves in a condition sensible to the mind; the dimensions of parts of our own body being in all cases the standard with which we ultimately compare those of other bodies. Or, where the body whose size is to be estimated is too large to be at once touched, then by passing a sensitive surface over its several parts, and appreciating (as we do by another exercise of our senses) the time required to traverse the whole of them, we acquire a knowledge of its extent. The appreciation of magnitude by the eye is always less perfect than that by touch, and is probably very erroneous till it has been frequently corrected by the evidence of touch in all the cases in which the latter sense can be employed, and by the comparison of the data obtained in one set of cases, by the exercise of both senses, with those of other cases in which sight only can be used. When a body or any number of objects is seen, we are sensible of the extent of surface of the retina which is occupied by the image formed by the concentrated rays of light proceeding from it or them; and we thus obtain a relative measure of their size. But the size of the image being absolutely much smaller than that of the object, it is only by the evidence of touch that we discern what relation the size of the body bears to the size of a part of our own body, and thereby what are, according to this ultimate standard, its dimensions.

Of the form of bodies we judge by our senses in the same manner as of their size, that is, by the estimation of the extent in different directions of the sensitive surface impressed in different modes by different kinds of light, or by bodies presented in different positions to the extremities of the nerves.

The perception of the locomotion of a body is derived from our perception of the movement of the impression which it produces over a sensitive surface, whether that of the eye or of the skin. And here also the evidence of sight is more fallacious than that of touch; for the movement of the impression on the retina being the same whether the eye, or the object seen, is moved, a person moved by other than his own efforts commonly requires the aid of other senses, or of his experience and understanding, to determine whether he himself, or the object he gazes at, be in motion; and indeed children in such cases commonly judge wrongly.

A kind of motion of which one at least of our senses has a most delicate perception is that of a vibrating body. By the skin the repeated impulses at short intervals produced by the vibrations of any body are felt as a tingling or itching, and this very obscurely. By the ear the same vibrations are perceived as sound, and this with such delicacy, that, according to the experiments of Savart, a note is distinguishable, though to produce it the air vibrates 48,000 times in a second: and if the undulatory theory of light be true, the eye can distinguish from other impressions of the same kind those which result from waves of light one-sixteen-millionth of an inch in breadth, and of which 727 billions move in one second.

One of the most remarkable results of the exercise of our senses is the appreciation of the distance of objects. It is probably only by experience that we discern that the bodies which become the objects of our senses are external to us; for, as already stated, all our ideas of external things are derived from the condition in which the nerves within us are placed by their influence, and not always by their direct influence. The eye, for example, sees nothing of the object of sight itself, but the extremities of the rays of light emitted from the object fall upon the sensitive extremities of the nervous filaments of the retina; and so of sounds, the body producing them being at a distance. Yet we judge that what we see and hear is neither within ourselves, as the impression of it is, nor near us, as the very sound and light which we perceive are, and as the bodies which we taste and touch are, but at a distance such that an appreciable voluntary motion will bring us nearer to them, and enable us perhaps to judge of them by the touch, from which we gain our first and least fallible impressions.

The appreciation of our own voluntary motion is the most important aid to our senses. Forming the standard to which all our ideas of force are ultimately referrible, it is of the highest importance, either separately or in conjunction with our senses, in enabling us to judge of velocity, weight, hardness, &c. But this has been already considered in the article MUSCLE.

Notions of a sixth sense have been entertained. Spallanzani observing that bats in flying avoid walls in the dark, conceived that they have some special sense for that and other similar purposes. But there can be little doubt that it is by the touch of the extremities of their wings that they perceive the resistance of near objects, and it is probable that all the examples of supposed peculiar senses are referrible to the refined exercise of one of those generally admitted, or of the muscular sensibility. Müller (*Physiologie des Menschen*, bd. ii., p. 275) justly says on this subject, 'The essential of a new sense does not consist in external things being perceived which commonly do not act upon the senses, but in external circumstances exciting a peculiar kind of sensation which does not exist among the sensations of our five senses. A peculiar kind of sensation must depend on the energies of the nervous system, and that such a one occurs in particular animals cannot be *à priori* denied; but there are no facts known which prove the existence of a new and peculiar kind of sense: and it is quite impossible to observe anything respecting the nature of a sensation in any one else than one's self.'

SENSIBILITY, an aptitude for receiving impressions of the senses. This is its physiological meaning, as designating that faculty of the senses whereby things external are made to act upon us. That peculiar fineness of organization which renders a man alive to the impressions of physical objects, has, by a natural metaphor, become the expression of that peculiarity of mental organization which renders the mind alive to impressions of moral objects, such as pity for the distress of others, admiration of heroic courage or patient endurance, &c.; and thus a person with a keen sense of grandeur, sublimity, nobility, beauty, or pathos in nature or art, is said to possess great sensibility. It is this moral aspect of sensibility which in all people creates the love of poetry and fiction, and when possessed in a high degree, creates the poet himself.

The theory of universal sensibility propounded by Campanella is so striking, and has such a poetico-metaphysical interest, that we take this opportunity of giving our readers a brief outline of it, as given in his work *De Sensu Rerum*:

'All things *feel (sentiunt)*; if they did not, the world would be a chaos. For neither would fire tend upwards, nor stone downwards, nor waters to the sea; but everything would remain where it was, were it not conscious that destruction awaits it (*sentiret sui destructionem inter contraria*) by remaining amidst that which is contrary to itself; and that it can only be preserved by seeking that which is of a similar nature. Contrariety is necessary for the decay and reproduction of nature; but all things strive against their contraries, which they would not do if they did not perceive what is their contrary. God, who is primal power, wisdom, and love, has bestowed on all things the power of existence, and so much wisdom and love as is necessary for their conservation during that time only for which his providence has determined that they shall be. Heat therefore has power and sense, and desire of its own being: so have all other things, seeking to be eternal like God; and in

God they are eternal, for nothing *dies* before him, but is only *changed*. Even to the world, as a sentient being, the death of its parts is no evil, since the death of one is the birth of many. Bread that is swallowed dies to revive his blood; and blood dies that it may live again in our flesh and bones; and thus the life of man is compounded out of the deaths and lives of all his parts: so is it with the whole universe. God said, Let all things *feel;* some more, some less, as they have more or less necessity to imitate my being *(et me imitentur in essendo);* and let them desire to live in that which they understand to be good for them; lest my creation come to nought.

'The sky and stars are endowed with the keenest sensibility; nor is it unreasonable to suppose that they signify their mutual thoughts to each other by the transference of light, and that their sensibility is full of pleasure. The blessed spirits that inform such living and bright mansions behold all things in nature and in the divine ideas. They have also a more glorious light than their own, through which they are elevated to a supernatural beatific vision.

'The world is full of living spirits; and when the soul shall be delivered from this dark cavern, we shall behold their subtle essences. But now we cannot discern the forms of the air and the winds as they rush by us, much less the angels and dæmons who people them. . . . . The world is an animal, sentient as a whole, and enjoying life in all its parts *(omnesque portiones ejus communi gaudere vita).*'

From the foregoing outline may be gleaned a general idea of this hypothesis and its daring assumptions, which, however consonant to a poetical temperament, require greater accuracy, larger data, and more logical deductions, before this hypothesis can have any weight with exact thinkers; and in fact it has gained few converts.

SENSITIVE PLANTS is a term commonly applied to those species of plants that possess the property of visibly moving their leaves when they are touched or otherwise stimulated. This term is not applied generally to plants in which any movements can be observed; for the power of moving under the influence of certain external stimulants is a very general property of the tissues of plants, and especially of the flowers. [SLEEP OF PLANTS.]

There are a great number of species of plants of various families, that possess the power of moving under the influence of a slight touch, and we shall here point out some of the most remarkable. That which is best known is a plant belonging to the order Leguminosæ, called *Mimosa pudica.* It is a native of tropical climates in moist districts, where it is exposed to a temperature of between 70° and 80° Fahr. It is in its native districts where its excitability is seen to the greatest perfection. A knock upon the ground at a short distance from the plant is sufficient to produce an influence on the leaves; and Von Martius says, that at Rio Janeiro the falling of horses' feet by the way is sufficient to set whole masses of mimosas in motion. When in this country, the motions of the plant are always best displayed in high temperatures. It is an annual, and has compound digitate leaves, which are formed of four pinnules, or leaflets, each of which is furnished with numerous pairs of smaller leaflets, which, in a natural state, are expanded horizontally. The parts of the leaf which are subject to the movements are the joints, or the points where the petioles and subpetioles are united to the stem and each other. At each of the joints there is a little swelling or knot, in which the irritable property seems to reside. If any one of the pairs of leaflets be touched or cut, or concentrated light be thrown upon it from a lens, the 'leaflet will immediately move together with the one opposite to it, both bringing their upper surfaces into contact, and at the same time inclining forwards or towards the extremity of the partial petiole on which they are seated. Other pairs of leaflets nearest to the one first stimulated will then close in succession in a similar manner; and at length the partial petioles themselves fold together by inclining upwards and forwards. Last of all, the influence is transmitted to the common petiole, which bends downwards with its extremity towards the ground, in a direction the reverse of those taken in the former cases. The effect is next continued to the other leaves nearest to the one first stimulated, and they fold their leaflets and depress their petioles in a similar manner.' (Henslow.) The influence of the stimulant is communicated as easily from below as above; and if the leaf is touched in the centre, the effect takes place above and below the seat of irritation.

These effects are not alone produced by mechanical irritants, for if various corrosive substances, as bichloride of mercury, sulphuric acid, caustic potash, &c., are applied to the knots of the joints, the same phenomena are observed. The removal of the plant to a higher temperature will produce the same result, as well as exposing it to a lower temperature or a draught of cold air.

The mechanism by which these movements are effected seems to reside in the swelling of the joints. If one of these swellings is cut into on one side, the leaf will be drawn to the wounded side, and if it be cut into on the upper side, the leaf will remain permanently elevated, and if on the under side, it will be permanently depressed. It is not however all the tissues composing the joint in which the irritable property resides, for Dutrochet found that on removing the woody fibre and leaving the cortical substance and pith, no irritability remained, whilst this property continued if the latter were removed. He therefore concludes that it is in the woody fibres and ducts that this property resides. Burnett found that if a single leaf with its stalk was removed carefully, it retained its properties for some time after. Mayo asserts that the under portion of the swellings of the joints is much more susceptible than the upper portion, and produces contraction under the influence of much slighter stimulus.

In the minute anatomical structure of the swelled joints of Mimosa some differences from the structure of other plants have been pointed out; but not greater, it appears to us, than would occur on the comparison of the structure of the same part in any two different species.

Another remarkable instance of the movements of the leaves of plants in the order Leguminosæ is seen in the *Hedysarum gyrans.* This plant is a native of Bengal, and has ternate or three-parted leaves. The end-leaf is much larger and broader than the two side leaves. The motions in these leaves are continual, and not produced by any accidental stimulus, as in the last case. Hufeland, who has described the motions of these leaves very carefully divides them into two kinds, voluntary and involuntary. The involuntary movements are those which take place in the large terminal leaflet, and which are only observable during the influence of the sun's rays upon the plant. Early in the morning the petiole forms an acute angle with the stem, and as the sun's rays get stronger, the leaf, which was previously dependent, begins to rise; this goes on till noon, when the leaf and the petiole are on the same plane; as the sun declines, the leaf begins to fall, and the petiole approaches closer to the stem, till at last, when night comes, the stem and petiole are parallel and embraced by the leaf, which cannot be separated without destroying its tissues. These movements are seen best in hot weather and clear days. The passing of a few clouds over the sun will influence the movements considerably. This motion is entirely independent of mechanical stimuli, and cannot in any way be increased by their application.

The second kind of motion in these plants, called by Hufeland voluntary, is seen in the two smaller lateral leaflets. This movement consists in the alternate rising and falling of the two opposite leaflets; when one is up, the other is down. By the time the one has attained its lowest point, the other has attained its highest, and they thus both commence a contrary action at the same moment. These movements continue day and night. The rapidity with which they are effected differs according to circumstances. In the hot native climate of the plant these leaves move most rapidly. Under favourable circumstances Meyen has observed the entire change in the position of the leaves to take place in one minute, but it mostly requires a longer period than this. The younger the leaves are, the more rapid is the motion, and in the older leaves both the one and the other movements cease. Both Hufeland and Meyen have recorded the result of their experiments with electricity on these movements, and they found the motions decidedly influenced both by electricity and galvanism. The structure of the petioles in these plants is very similar to those of the Mimosa pudica, and, as in them, does not throw any light on the peculiar movements they possess.

The resemblance between the movements of these plants and those of animals, especially of some of the lower forms, has led some to suppose that they are of the same nature, and that in plants, as in lower animals, they may depend on a nervous system not demonstrable by the dissecting knife, but existing in a diffused form and evinced by its peculiar functions. This inference however cannot be correctly drawn in the present state of our knowledge. We know too little of the intimate nature of those complicated phenomena which are termed life, to be able to carry out such a generalization. The difference between the movements of these plants and those of the lower animals seems to consist in the end which they accomplish. In animals the end or object of motion is always the nutrition or reproduction of the species, but in the motions of these plants no such end is effected. In fact, in our present want of knowledge on the subject, the motions of the leaves of plants at least may be called accidental. The movements observed in some of the tissues and in the stamens and pistils of plants have a much more striking affinity with the motion of animals than those mentioned above.

Besides the Mimosa pudica there are several other species belonging to this genus that possess the same property, though not in so remarkable a degree. Amongst these may be named *Mimosa sensitiva, M. viva, M. casta, M. asperata, M. quadrivalvis, M. pernambucana, M. pigra, M. humilis, M. peltata, M. dormiens.* Species of other genera of the same natural order Leguminosæ exhibiting these movements are *Smithia sensitiva, Æschynomene Indica, A. pumila,* and *Desmanthus stolonifer.* The locust-tree when its branches are roughly shaken closes up its leaves, and the same has been observed of *Gleditschia triacantha,* and it is probable that close observation during hot weather would prove that other leguminous plants possess this property.

Another family of plants that exhibit sensation when touched or stimulated is Oxalidaceæ. The *Oxalis sensitiva,* called by De Candolle, on account of its sensitive properties, *Biophytum,* has long been known to possess this property. *Averrhoa bilimbi* and *A. carambola* are both plants belonging to Oxalidaceæ, and have been described by travellers as possessing the property of folding their leaves on the application of a stimulus. But it is not only in these species that this property resides, for Professor Morren of Liege has observed it to occur more or less in all the species of the genus Oxalis. His observations were first made on the *Oxalis stricta,* which, if hit smartly on a warm day, will contract its leaves and assume a position as in the ordinary sleep of the leaves of these plants. He has also observed the same movements in *O. acetosella* and *O. corniculata,* and many extra-European species. The movements in these plants consist in the folding up of their leaves, so that the two halves of the leaf approach each other by their superior surface. The midrib is also slightly bent, so that its inferior surface presents a convexity; and the petioles of the leaflets bend downwards, so that the leaf, when irritated, becomes dependent. A full account of the structure and movements of these plants will be found in Professor Morren's paper entitled 'Notes sur l'Excitabilité et le Mouvement des Feuilles chez les Oxalis,' in the 6th volume of the 'Bulletins de l'Académie Royale de Bruxelles.'

In the family Droseraceæ, or Sun-dews, are some plants which exhibit a considerable amount of irritability. A description has already been given of the *Dionæa muscipula,* or Venus's Fly-trap [DIONÆA], whose leaves have the remarkable property of contracting upon insects that may happen to alight upon their surface. None of the sun-dews enclose insects in their leaves in this manner, but the surface of their leaves is covered with long hairs, which secrete a viscous matter. When any insect settles upon the leaf, it is entangled with the viscous secretion; and before it has time to escape, the hairs exhibit a considerable degree of irritability, and curving round, pin the animal down on the surface of the leaf.

Other instances of vegetable irritability occur in the Berberis vulgaris, Mimulus, and Stylidium. [BERBERIS; MIMULUS; STYLIDIUM.]

Among the Cryptogamia are some which exhibit motions more nearly resembling those of the animal kingdom than any we have referred to above. It appears that the lower we descend in the animal and vegetable kingdom, the more nearly do the objects of the two kingdoms approach each other. It is well known that many of the minute organic beings that require a microscope to ascertain their existence have been referred by some naturalists to the animal kingdom, and by others to the vegetable kingdom. But since the publication of Ehrenberg's great work on Infusoria, botanists seem to have given up all claim to the beings which he has described and figured in so masterly a manner as animals, but which had previously been looked upon as plants. Independently however of the doubtful microscopic genera of Baccillaria, Synedra, &c., there are several of the Conferva tribe that exhibit singular movements. One of the most remarkable of these is the Oscillatoria. The movements of this plant were discovered in 1753 by Adanson. When the fibres of this plant are seen in water, they are constantly moving, now doubling themselves into the form of the letter S, then straightening themselves and doubling again, and so on. When a fibre is laid flat upon a plate, it turns itself backwards and forwards like the hand in pronation and supination. Sometimes these motions are slow, sometimes quick, and at other times they are effected by jerks. These motions only occur in the young fibres, and cease entirely when they are fully grown. These plants are very abundant in ditches, ponds, and damp places, and may be easily procured for the purpose of inspection. The rapidity of their growth is very extraordinary: they grow ten or twelve times their length in the course of as many hours. Some have attributed these movements to their rapid growth, but this will hardly explain their wavering motion.

Meyen describes a small cryptagamic plant, which he calls *Stigmatonema stellata,* as possessing the power of moving its fibres in different directions. A very peculiar spiral contraction of the fibres in one of these confervoid plants has been observed by Link. This plant, if its fibres be elongated for almost any period, immediately contracts them into a spiral form when the force is removed. It has been called by Link *Spirogyra princeps.*

For further information on this curious subject, the reader may consult Meyen's *Neues System der Pflanzen Physiologie,* band iii.; Dutrochet's *Mémoire sur la Motilité des Végétaux;* and various papers by Morren, in the *Mémoires de l'Académie Royale de Bruxelles.*

SENSO'RIUM. [BRAIN.]

SENTENCE. [ORGANON.]

SENTINEL or SENTRY (from *sentire,* to look or perceive) is a term now applied to an infantry soldier when placed on guard before the palace of a royal personage, or before some other public building; also when guarding the ramparts of a fortress, or, on an army being in the field, when he is stationed on the exterior of the line of outposts. [PIQUET.]

SEPAL (in Botany). This term is applied to the divisions of the calyx. [CALYX.] According as the calyx is divided into parts, it has received designations expressive of their number, the term *sepalous,* with a Greek numeral prefixed, being used. Thus, for example, if there are two sepals, the calyx is disepalous; if three, trisepalous; if four, tetrasepalous, and so on. Sometimes the sepals all adhere by their edges; this is called by some writers a *monophyllous* calyx, and by others more properly a *gamosepalous* calyx.

SEPARATE PROPERTY. By the common law of England the husband acquired by the marriage a freehold interest in, and a right to dispose of the rents and profits, during the joint lives of himself and his wife, of all the estates of inheritance of which she was at that time seised, or might become seised during the coverture, as well as a right to an estate for his own life as tenant by the curtesy in the event of his surviving his wife and there having been issue of the marriage. By the common law, also, marriage was an absolute gift to the husband of all the goods and personal chattels of which the wife was actually possessed at that time or might become possessed during the coverture, and it gave him a right to dispose of her chattels real and of such of her choses in action as he should have reduced into possession during the same period. There was no mode by which the wife could take or enjoy any estate or property absolutely independent of her husband.

In process of time, however, limitations of both real and personal property to the separate use of the wife were established in Courts of Equity, and the validity of them has been recognised even in Courts of Law. It was at first considered necessary that property which was to be enjoyed by a married woman for her separate use should be vested in trustees for her, but it has since been settled that where either real or personal property is given to the separate use of a married woman, without any appointment of trustees, the husband shall be considered a trustee for her. This principle applies *à fortiori* when the property is expressly given to the husband for the separate use of his wife. In the same manner the agreement in writing between the husband and wife before marriage, that his wife shall be entitled to any specific property for her separate use, converts him into a trustee for her as to that property; and if the subject of the agreement be real estate, and be such as to give the wife a power of disposition, the agreement will be binding on her heir, and make him a trustee for her appointee. The consideration of what is or is not a valid settlement of property by the husband to the separate use of his wife as against creditors and purchasers, belongs to the general doctrine of marriage settlements. [SETTLEMENT.]

Many questions have arisen upon the construction of particular instruments as to what words are necessary to raise a trust for the separate use of the wife. The result of the cases upon this point may be stated to be, that when, from the nature of the transaction and the context of the instrument, the intention to limit the property to the wife for her separate use is clear, whatever may be the particular expressions used, that intention will be carried into effect; but that the courts of Equity will not interfere to deprive the husband of the interest which he would otherwise take in his wife's property upon doubtful inferences or ambiguous expressions. It has sometimes been doubted whether property could be limited in trust for a woman, whether married or sole at the time, so as to enure to her separate use in the event of a second or future marriage; but the recent decisions upon this point, in accordance with the general practice of conveyancers, leave no room now to doubt their validity. The intention to extend the limitation to future covertures must however be clearly declared; for if the apparent object be to protect the fund against the particular husband, a declaration that the trust shall continue during the life of the woman will not extend it to a future marriage.

Separate estate may be acquired not only in lands and personalty, but in the profits of trade carried on by the wife on her separate account, in consequence either of express agreement between her and her husband before marriage, or his subsequent permission. Upon the general principles applicable to marriage settlements, the agreement in the former case will be good against creditors; in the latter, against the husband only. In such cases the stock in trade and property required for carrying on the business are usually vested in trustees for the wife, who is considered at law as their agent, and should carry on all business transactions in their names. But if no trustees should have been appointed, the rule of equity before stated will apply, and the husband will be bound by his agreement, that all his wife's earnings in trade shall be her separate property and at her own disposal.

When personal property, whether in possession or reversion, is settled to the separate use of a married woman, she may dispose of it and the produce of it as a feme sole to the full extent of her interest, though no particular power be given by the instrument of settlement. But a mere limitation of real estate in fee to the sole and separate use of a married woman, though it enables the wife to dispose of the rents and profits as a feme sole, gives her no power of disposition over the estate beyond what she has by the common law. The gift to the separate use may be accompanied by an express power of appointment by deed or will. The rules of law relating to the formal execution of such powers, and the cases in which defective execution will be supplied, are the same as those which are applicable to the execution of powers in general. [USES.]

It is not necessary in all cases of settlement of personal property to the separate use of a married woman, accompanied with a power of appointment, that she should appoint in terms of the power. Upon this point the following distinctions are established:—1, When there is an express limitation of an estate for life in the fund to the wife, with a power to appoint the principal after her death, the wife can dispose of the capital only by an execution of the power, which may be immediate, if the power authorise an appointment by deed; but if it require the appointment to be made by will only, then it cannot take effect till after her death. This is equally true whether the limitation in default of appointment be to a stranger, to the next of kin, or to the executors and administrators of the wife. 2, When the wife takes the absolute interest in the property, although it should be limited to her in the form of a power, she may dispose of it under her general power, and without regard to the ceremonies prescribed by the instrument. Under the second head are included all the cases in which the trust for the wife appears to be of the principal and not of the interest only, and the effect of such a limitation will not be controlled by the introduction of any subsequent provisions as to the mode of payment of the interest or otherwise.

The foregoing observations with respect to the powers of disposition by a married woman of the capital of a fund given generally to her separate use, are equally applicable to the cases where the interest or rent of property only, or income of whatever kind, is the subject of the settlement. If no particular power to dispose be given, she may do so under that general power which, as before mentioned, a married woman possesses over her separate personal estate; and even where a particular mode of disposition is prescribed in the instrument of settlement, she will not, it seems, be bound to follow it.

If the wife, having a general power of disposition of her separate property, permit her husband during his life to receive and apply her separate estate as his own, a gift from her will in general be presumed, and she will not be allowed at his death to charge his estate with the amount so received.

If the wife, having power to dispose absolutely of her separate property, die without making any disposition of it, the quality of separate property, it seems, ceases at her death, and the surviving husband is entitled to the fund. If the property consist either of chattels real or personal in possession, he will be entitled to them without administration; but if of choses in action, he must take out administration to her estate.

In some cases where a married woman, having an absolute power of appointment over a fund, has executed it, a bill has been filed in order that the consent in court of the wife to the disposition might be taken; and this practice occasioned a doubt whether it was not necessary that the wife's consent in court should be obtained, especially in cases where the appointment was in favour of the husband. But unquestionably the appointment is valid without any such consent, and the presence of the wife in court, whether the appointment be to her husband or to strangers, is entirely unnecessary.

It was at one time doubted whether the wife's general power of alienation of her separate estate could be restrained by the expressed intention of the settlor, such restraint being thought repugnant to the interest which she had in the property; but the power of the settlor to impose it is now established by undoubted authority. The intention to impose this restraint will not however be inferred in the absence of express words to that effect. If the gift be to a woman unmarried at the time when it takes effect, a clause against anticipation, that is, a clause which prohibits or limits the power of alienation, though inserted expressly in contemplation of a future marriage, is inoperative, as it would be in the case of a man, to prevent alienation while she continues sole; and if the gift be to a woman married at the time, the property becomes absolutely disposable by her upon the expiration of the coverture. It has also been much questioned whether, in the cases supposed, the property, if not alienated by the woman while discovert, would be subject to the settlement to her separate use and to the prohibition against anticipation during any future coverture or covertures. The question has been lately decided in the affirmative, and may now be considered as settled. (Tullet v. Armstrong, 4 M. & C., 390.)

It has been stated that if a married woman has property settled to her separate use, without any restraint on alienation, she may dispose of it as a feme sole, either with or without consideration; but it seems to be now determined (though there are conflicting decisions on the point among the older authorities), that, in order to affect her separate estate, she must show an intention to charge it, and that it is not liable to answer generally the demands of creditors. It is not very clearly determined in what cases and from what circumstances the intention to charge the separate estate will be presumed. It seems to be established that the separate estate of a married woman is liable to debts for which she has given a written security or acknowledgment, such as a bond or promissory note. The extent to which a woman's separate property may be subjected to the demands of creditors claiming under parol agreements has not been determined. If the separate property consists of land, it will of course not be liable; because, by the statute of Frauds (29 Car. II., § 3), no agreements can affect lands unless they are in writing and signed by the party to be charged; but if of personalty, it is probable that an express parol agreement that her separate property should be charged with the payment of a debt, or even perhaps a tacit agreement to be implied from the circumstances, as when the wife is living separate from her husband, would be held binding on the property.

It has sometimes been considered that upon the principle of the general liability of the separate property to debts, after the death of the wife, in the administration of it among creditors, all ought to come in *pari passu*, as in other cases of the administration of equitable assets; but the later authorities seem to show that the separate property of a feme covert is not subject at her death to any such general liability, and from this it would appear to follow that the creditors whose debts are charged upon it ought, as specific incumbrancers, to be paid according to their priorities.

The wife, in equity, as at law, can incur no personal responsibility by her engagements as to her separate property, and is liable only to the extent of that property in the hands of her trustees: but in suits respecting her separate estate she is treated in all respects as a feme sole, and is personally answerable for contempt in not obeying the orders of the court. In such suits, if she is a plaintiff, she must sue by her next friend, and not with her husband, who however should be made a defendant to the wife's bill: and if she is a defendant, she must be served personally with process in the cause. She must answer by her next friend separately from her husband, who ought however to be made a party to the bill.

(Roper *On Husband and Wife;* and Sugden *On Powers.*)

SEPARATION A MENSA ET TORO. [Divorce.]

SE'PIA. [Sepiadæ.]

SE'PIADÆ (σηπια), a family of Cephalopoda. Under this head we shall treat of all those forms which are vulgarly termed *Cuttle-fishes.*

The genera comprehended under that term have been thus defined:

Animal in the form of a sack or purse, with or without fins; head large, very distinct, crowned with brachial appendages to the number of eight or ten; arms very unequal, always furnished with suckers on their internal surface, with or without hooks; branchiæ pyramidal; orifice of the organs of generation opening into the branchial pouch, which last communicates with the external surrounding medium by a sort of funnel, the tube of which opens under the neck.

Shell monothalamous or rudimentary, sometimes horny or cellular, but never polythalamous.* (Rang.)

Dr. Leach divided the group of *Cuttles* into two families, the *Octopods* and the *Decapods.*

Octopods.

Animal short, bursiform, ordinarily deprived of fins; head very distinct; eight sessile arms, generally nearly equal, and furnished with simple suckers; naked or testaceous; no internal testaceous rudiment, but only two small cartilaginous pieces in some species.

Professor Owen, in common with other zoologists, divides the Octopods into two groups or families, the *Testacea* and the *Nuda.*

The *Testacea* consist of the genera *Argonauta* [Paper Nautilus and Bellerophon]. [Cephalopoda, vol. vi., p. 429.]

The *Nuda* [Cephalopoda, *ibid.*] comprise the genera *Eledone* and *Octopus.*

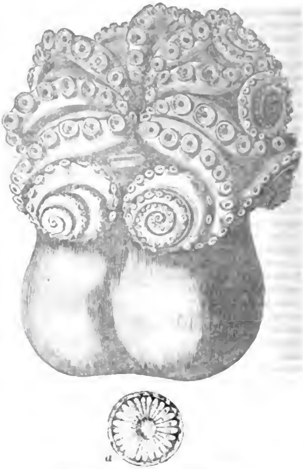
Eledone. (Aristotle; Leach.)

Generic Character.—Arms provided with a single series of sessile acetabula.

Example.—*Eledone ventricosa* (*Octopus ventricosus*, Grant).

Description.—Body short, round, the eight arms connected at their base by a membrane.

Our cut was taken by permission from the beautiful specimen captured at St. Just, Cornwall, in 1822, and preserved in *Mus. Coll. Chir.*, among the preparations illustrative of natural history in spirit, No. 164 A. 'Its arms are compressed, and connected at their roots by a thick web, and in the contraction preceding death they have become spirally convoluted in a very elegant manner; the three upper or dorsal pairs describing four gyrations, the ventral pair five; the surface of the integument is slightly wrinkled and granulate; it is of a mottled lilac or livid colour behind, but is smooth and approaches to white on the opposite aspect of the arms.' (*Catalogue*, part iv., fasc. 1.)



Eledone ventricosa. a, Sucker of Eledone.

Octopus. (Lam. πολύπους, Polypus, Antiq.; and Leach.

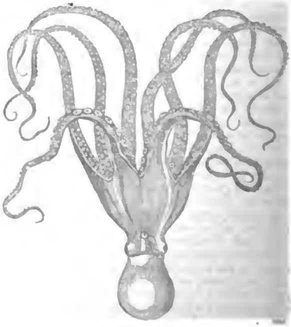
Generic Character.—Arms provided with a double alternate series of sessile acetabula.

Example.—*Octopus vulgaris* (*Sepia octopodia*, Linn. *Sepia octopus*, Gmel.).

Description.—Body short and ovoïd, the eight arms connected at their base by a wide membrane.

Locality.—The European seas.

This is the *Eight-armed Cuttle* of Pennant; the *Poulp* or *Preke* of the English. Professor Owen has given a very good figure of this species, representing it in the act of creeping on the shore, its body being carried vertically in the reverse position with the head downwards, and its back being turned towards the spectator, upon whom it is supposed to be advancing. (*Cyclopædia of Anatomy and Physiology*, vol. i., f. 210.) This is the cephalopod which is said to be luminous in the dark. Linnæus quotes Bartholinus for the statement that one gave out so much light when the candle was taken away, 'ut totum palatium ardere videretur.' It has also been alleged that the application of



Octopus vulgaris.

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* But note: the animal of *Spirula* is a decapod. [Spirulidæ.]

its suckers upon any part of the human body occasions inflammation and subsequent pain.

Three specimens of Octopus vulgaris are preserved in spirit. (*Mus. Coll. Chir.*, Nos. 162, 163, 164.)

It was probably a species of *Octopus* that Mr. Beale encountered while searching for shells upon the rocks of the Bonin Islands. He was much astonished at seeing at his feet a most extraordinary looking animal crawling towards the surf, which it had only just left. It was creeping on its eight legs, which, from their soft and flexible nature, bent considerably under the weight of its body; so that it was lifted by the efforts of its tentacula only a small distance from the rocks. It appeared much alarmed at seeing him, and made every effort to escape. Mr. Beale endeavoured to stop it by pressing on one of its legs with his foot; but although he used considerable force for that purpose, its strength was so great that it several times liberated its member, in spite of all the efforts he could employ on the wet and slippery rocks. He then laid hold of one of the tentacles with his hand, and held it firmly, so that the limb appeared as if it would be torn asunder by the united efforts of himself and the creature. He then gave it a powerful jerk, wishing to disengage it from the rocks to which it clung so forcibly by its suckers. This effort it effectually resisted; but the moment after, the apparently enraged animal lifted its head with its large projecting eyes, and, loosing its hold of the rocks, suddenly sprang upon Mr. Beale's arm, which he had previously bared to the shoulder for the purpose of thrusting it into holes in the rocks after shells, and clung with its suckers to it with great power, endeavouring to get its beak, which Mr. Beale could now see, between the roots of its arms in a position to bite. Mr. Beale declares that a sensation of horror pervaded his whole frame when he found that this monstrous animal had fixed itself so firmly on his arm. He describes its cold slimy grasp as extremely sickening, and he loudly called to the captain, who was also searching for shells at some distance, to come and release him from his disgusting assailant. The captain quickly came, and taking Mr. Beale down to the boat, during which time the latter was employed in keeping the beak of the cuttle away from his hand, quickly released him by destroying his tormentor with the boat-knife, when he disengaged it by portions at a time. Mr. Beale states that this cephalopod must have measured across its expanded arms about four feet, whilst its body was not bigger than a large clenched hand. It was the species called by the whalers 'rock-squid.' (*Natural History and Fishery of the Sperm Whale.*)

DECAPODS.

Animal generally elongated, cylindriform, having a thick sac, furnished with natatory expansions; head very distinct, crowned with ten arms, eight of which are sessile, shorter than in the octopods, and furnished with acetabula or suckers along the whole length of their internal surface, and two much longer (*tentacula*), which are retractile, not situated on the same line with the arms, pediculated, and furnished with suckers, which are situated ordinarily on the enlarged and terminal portion only.

No *shell*, but only a testaceous rudiment or support, which is either cartilaginous or calcareous in the interior of the back, in the greatest part of the genera.

Under this division come the *Teuthidæ* or *Calamaries*, and the true *Sepiadæ*, or *Cuttle-fishes*, properly so called.

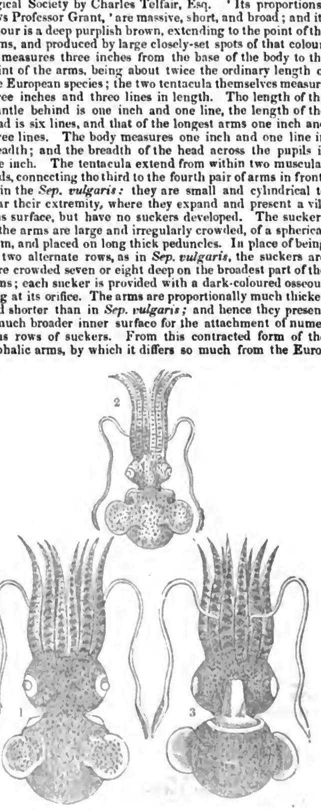
Sepiola. (Rondeletius. Leach.)

Generic Character.—Head of equal breadth with the body, owing to the magnitude of the eyes. Body scarcely ventricose, supported by a thin, flexible, transparent dorsal lamina, and with natatory organs extended from the sides of the body.

Example, *Sepiola vulgaris.*

Description.—Dr. Grant, in his interesting and beautifully illustrated paper on this species, describes the body or mantle of the specimens obtained on our coast as measuring generally about six lines in length, and as much in breadth, whilst the head measures only four lines in length, and, from the magnitude of the eyes, is equal in breadth with the body. The arms are of unequal lengths, the longest being about an inch long, and the shortest about a line less. The first or dorsal pair are the shortest, the second and fourth equal in length, and a little longer than the first pair; and the third pair the longest. This, Dr. Grant observes, is the order of the comparative lengths of the arms most common in the *naked cephalopods*. The third and fourth arms on each side are connected to each other by a musculo-membranous fold, which extends to about a third of their length, and is covered by the skin and subjacent coloured spots. The arms, which are allied to those of *Octopus* in their length, agree with those of *Loligo* in being provided with numerous long pedunculated suckers, which are globular, the peduncles being thick and conical, and arranged in two irregular rows on each arm. General surface of the body pale reddish; very dark purple spots, rare and small, extend over the mantle and the dorsal surface of the fins, the head and arms, and, partially, over the tentacula, and are interspersed with a few patches of larger size, and of the same deep purple colour. The tentacula, about half an inch in length, are thin and cylindrical to near their termination, where they expand a little, and terminate in a point. They proceed, as in other decapods, from between the third and fourth arms on each side. (*Zool. Trans.* vol. i.)

Dr. Grant has in the same paper described a new species (*Sepiola stenodactyla*) sent from the Mauritius to the Zoological Society by Charles Telfair, Esq. 'Its proportions,' says Professor Grant, 'are massive, short, and broad; and its colour is a deep purplish brown, extending to the point of the arms, and produced by large closely-set spots of that colour. It measures three inches from the base of the body to the point of the arms, being about twice the ordinary length of the European species; the two tentacula themselves measure three inches and three lines in length. The length of the mantle behind is one inch and one line, the length of the head is six lines, and that of the longest arms one inch and three lines. The body measures one inch and one line in breadth; and the breadth of the head across the pupils is one inch. The tentacula extend from within two muscular folds, connecting the third to the fourth pair of arms in front, as in the *Sep. vulgaris*: they are small and cylindrical to near their extremity, where they expand and present a villous surface, but have no suckers developed. The suckers of the arms are large and irregularly crowded, of a spherical form, and placed on long thick peduncles. In place of being in two alternate rows, as in *Sep. vulgaris*, the suckers are here crowded seven or eight deep on the broadest part of the arms; each sucker is provided with a dark-coloured osseous ring at its orifice. The arms are proportionally much thicker and shorter than in *Sep. vulgaris*; and hence they present a much broader inner surface for the attachment of numerous rows of suckers. From this contracted form of the cephalic arms, by which it differs so much from the Euro-



1, 3. Sepiola stenodactyla, back and front views, (reduced).
2. Sepiola vulgaris, back view (nat. size). (Grant, *Zool. Trans.*)

pean species, I have termed it *Sep. stenodactyla.* In some parts of the arms, the crowded arrangement of the suckers is seen to depend on the zig-zag direction taken by the rows of peduncles on each side. The coloured markings on the outer surface of the arms are in the form of transverse bands; in *Sep. vulgaris* they are generally minute detached spots. The white band around the upper margin of the mantle, the lengthened form of the syphon and the position of its valve, the form and the subdorsal direction of the eyes, the shape and position of the dorsal fins, and the rounded termination of the mantle, are like those of the common species. This Indian species however is more than four times the size of any European specimen which I have seen, and the form of the mantle is more ventricose.' (*Ibid.*)

Rossia. (Owen.)

Generic Character.—Body ventricose; two wide, rounded, subdorsal fins; anterior margin of the mantle free. Arms rather short, trihedral; the acetabula pedunculated; the peduncles very short, in two alternating rows at the base of the arms, aggregated in many rows at their point: order of the length of the equal arms, 1, 2, 4, 3. Tentacula equalling the body in length furnished at the apex with many very small pedunculated acetabula. Gladius horny, nine lines in length, a little dilated below.

Example, *Rossia palpebrosa.*

Professor Owen, who established this genus upon a cephalopod brought from the Arctic regions by Captain James Ross, R.N., and taken near the beach at Elwin Bay, Prince Regent's Inlet, on the 29th of August, 1832, states that it differs from *Sepiola* and *Sepioteuthis* in the form, proportions, and position of its lateral fins, and in the extent of its horny dorsal style or *gladius.* In these respects, he observes, it bears a closer affinity to *Sepiola*, but differs from it generally in having the anterior margin of the mantle free in the whole of its circumference; its natural position is therefore, in his opinion, intermediate to *Sepiola* and *Sepioteuthis*, which it connects together, as well by its intermediate size, as by the peculiarities of its structure.

The measurements of the specimen, which, Mr. Owen observes, had shrunk in all its dimensions in consequence of having been macerated in spirit, were—

	Inches.	Lines.
Length from the end of the visceral sac to the end of the longest tentacle . .	5	0
Ditto from the end of the visceral sac to the anterior margin of the mantle . .	1	9
Length from the end of the visceral sac to the interspace of the first or middle pair of dorsal brachia	3	2
Ditto of the tentacle	4	2
Breadth of the body, exclusive of the fins .	1	8
Ditto of the head across the eyes . .	1	3

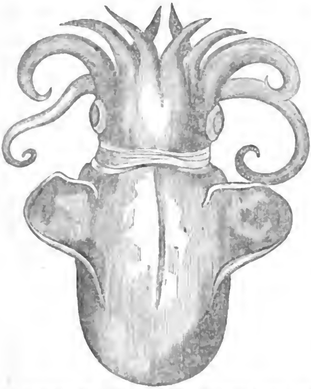
Professor Owen states that the specimen presented a dull dusky-brown colour over the whole of the dorsal and lateral aspects, and over the exterior of the arms. The pigment producing this hue was disposed in minute close-set points. Captain Ross's drawing of the recent animal exhibited a greenish metallic lustre, reflected from these surfaces, slight remains of which were still perceptible in the specimen. The ventral surface was of a light ash-colour. The form of the abdomen or visceral segment of the body was more ventricose than in *Sepiola.* The anterior margin of the mantle projected slightly forwards at the middle of its dorsal aspect, as in *Sepioteuthis*, and was reflected downwards for about half an inch before, being continued upon the back part of the head. There was a transverse groove on either side of the mantle, about a line behind its anterior margin: this part was colourless anterior to the grooves, as in *Sepiola.* The fins were short, semicircular, dorsal in their position, but nearer the sides of the body and placed more forwards than in *Sepiola vulgaris;* the interspace between their origins was to the breadth of the body as 3 to 4, whilst in *Sepiola vulgaris* it was as 3 to 5. They projected laterally from the body with a slight inclination, and measured one inch in length and ten lines in breadth. The arms were proportionately shorter and thicker than in *Sepiola*, more resembling those of *Sepia*, but not having the same relative dimensions as in that genus, *e.g.* the third, and not the fourth pair, was the longest (counting from the dorsal aspect), but the fourth pair was proportionately longer than in *Sepiola.* The measurements were,—

	Inches.	Lines.
First pair . . .	1	0
Second pair . . .	1	3
Third pair . . .	1	9
Fourth pair . . .	1	5

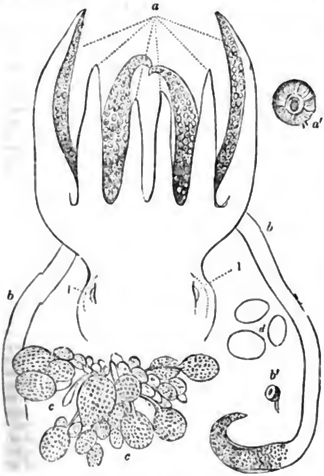
They presented the usual three-sided pyramidal form, with the internal facet beset with the suckers or acetabula. These were of a globular figure, supported by very short sublateral peduncles. Beginning from the base of the arms, the suckers were arranged in a double alternate series; this disposition prevailed along the whole of the first pair, along three-fourths of the second pair, and along about half of the third and fourth pairs of arms, beyond which the suckers were aggregated into irregular transverse rows of from three to five, diminishing in size to the apex of the arm. In this respect, there was an intermediate structure between *Sepiola*, in which the suckers are in a double alternate series along the whole arm, and *Sepia*, in which they are aggregated from the commencement. The horny cup in each acetabulum had the margin entire; and its diameter was equal to one-third of the fleshy sphere in which it was implanted. The tentacles were round, and slightly dilated at their extremities, which were beset for about nine lines by minute and close-set suckers; these diminished in size towards the extremity of the tentacle, and the largest of them did not exceed one-fiftieth of an inch in diameter. The horny cup of these acetabula was proportionately larger than in those of the arms, and their pedicles were longer. A narrow membranous expansion was extended along the sides of the dilated extremities of the tentacle. The tentacles emerged from within the membrane extended between the third and fourth pairs of arms, but this interbrachial fold, though of greater breadth, did not connect the arms together for a greater extent than the membrane between the third and second, or that between the second and first pairs of the legs; but there was no corresponding fold between the ventral pair of arms. In this respect *Rossia* resembled *Sepiola* and *Sepia;* in all of which therefore, Professor Owen observes, the interbrachial membranes have obviously other uses than to protect the tentacles, which can be retracted into a cavity below the base of the arms. Mr. Owen thinks that they probable serve, but in a minor degree than in *Octopus*, as a retropulsive fin. The eyes of the specimen were of large size, forming the usual convexity on each side of the head; they were however almost completely hidden from the view by the contraction of the lower eye-lid principally; the opening of the fold corresponding to the transparent portion of the integument continued over the eyeball (for, Mr. Owen remarks, the animal cannot be said to possess a true cornea) was of a longitudinal figure and dorsal in its position. In *Sepiola*, he observes, there is a slight fold beneath the eye, corresponding to the largely developed eyelid in *Rossia;* but there is a greater proportionate breadth of the head at this part in *Sepiola.* The siphon, or funnel, extends to within a line of the interbrachial membrane of the ventral pair of arms, resembling in this respect *Sepiola* rather than *Sepia*, or *Sepioteuthis*, where the funnel reaches only half-way between that part and the margin of the mantle. It was depressed and tapered towards the extremity; within the tube, and two lines distant from the end, was seen the small valve, which exists in all the Cephalopods that have locomotive organs adapted for propelling them forwards. On either side of the base of the funnel there was an oblong cartilaginous depression, surrounded by a raised margin, to which a corresponding projection on the inner side of the mantle was adapted. This structure for strengthening the attachment between the mantle and the head is met with, Professor Owen observes, in all the *Decacera*, or Decapods, and in *Ocythöe* (*Argonauta*), but does not exist in *Octopus.* The membranous expansions from the sides of the base of the funnel, corresponding to the '*callottes*' in *Octopus*, extended in *Rossia* round the anal aperture. The rudimentary dorsal shell or gladius was not more than nine lines in length, and one line and a half in breadth at its lower and dilated half; there was a longitudinal mesial ridge on its external surface, and a corresponding groove with lateral ridges on the opposite side: it was of firm texture and brown colour anteriorly, but became thin, soft, white, and cartilaginous at its posterior extremity.

For the interesting details of the anatomy we must refer the reader to the Appendix to Captain Sir John Ross's 'Second Voyage.' The ink-bag was situated between the liver and the muscles which surround the arms, close to which its duct entered the intestine. The ink was black, of the same tint as the China ink.

With reference to the remarkable development of the skin surrounding the eyeball (whence the trivial name *palpebrosa*), by means of which this animal evidently possesses the power of defending the eye, as the pulmonated *vertebrata* do by means of their more regularly-formed eyelids, Professor Owen observes that the utility of the provision, in seas abounding with fragments of ice, is obvious.



Rossia palpebrosa, dorsal aspect, showing the appearance of the eyes while the animal was alive.



Head and arms of Rossia palpebrosa, on the dorsal aspect, taken from the figure where it is laid open to show the internal structure. Here the eyelids (l, l) are represented closed after death. *a*, the eight arms. *a'*, one of the brachial suckers, magnified. *b*, the two tentacles. *b'*, a tentacular sucker, magnified. *c*, ovisacs in the ovary, appended to filamentary pedicles. *d*, eggs. (Owen, Ross's *Appendix*.)

Sepioteuthis. (De Blainv.)

Generic Character.—Animal elongated, bordered nearly throughout its length by a natatory membrane, which is narrow and lateral; arms sessile and pedunculated, as in the Calamaries, and less enlarged than in the Cuttles; acetabula as in the Calamaries.

Internal support or gladius comparatively wide, but horny and delicate.

Example, *Sepioteuthis sepiacea.*

This species is figured in the article CEPHALOPODA under the name of *Sepia officinalis*, to which however it bears a very close external resemblance, so close indeed that authors generally place it immediately before that species.

Cranchia. (Leach.)

Generic Character.—Animal furnished with a bursiform sac, which is elongated and rounded posteriorly; aperture narrow; dorsal border not distinct; head less distinct from the body; arms sessile, unequal; tentacles pedunculated, longer, retractile, terminated in a club shape; peduncles without acetabula?; caudal fins circular, touching each other at their origin.

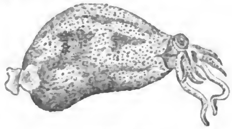
Internal support unknown. (Rang.)

The character as given in the Appendix to Capt. Tuckey's *Narrative*, where the animal was first figured, is—

Body oval, sack-shaped; fins approximating, their extremities free; neck with a frænum behind, connecting it with the sack, and with two other fræna connecting it with the sack before.

Example, *Cranchia Scabra.*

Description.—Sack rough, with hard rough tubercles. (Appendix to Tuckey's *Congo.*)



Cranchia scabra.

Loligopsis. (Lam.)

Generic Character.—Body long and cylindrical, terminated by a pair of conjoined large round fins, forming generally a circular disk; anterior border of the mantle adherent to the back part of the head for a small extent. *Tentacula* very long and slender (frequently mutilated). *Gladius* long, narrowest in the middle, dilated posteriorly.

The *tentacula* of this genus are sometimes enormously long.

Example, *Loligopsis Veranii*. Fér.

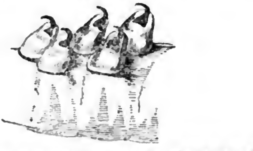
Onychoteuthis. (Lichtenstein.)

Generic Character.—Body and fins as in the genus *Loligo;* ventro-lateral cartilages of the mantle long and narrow; horny hoops of the tentacular, and sometimes of the brachial, acetabula produced into the forms of hooks or claws.

Gladius or internal support long, broadest in the middle.

Example, *Onychoteuthis Banksii.*

Professor Owen, after dwelling on Dr. Roget's accurate description of the mechanism by which the suckers of *Octopus* are worked [CEPHALOPODA, vol. vi., p. 424], observes that still there are circumstances in which even this remarkable apparatus would be insufficient to enable the cephalopod to fulfil all the offices in the economy of nature for which it was created; and that in those species which have to contend with the agile, slippery, and mucus-clad

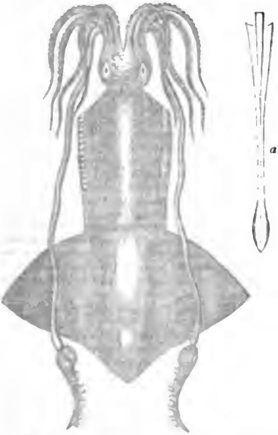


Uncinated suckers of Onychoteuthis, from specimen in spirits in Mus. Coll. Chir. (by permission).

fishes, more powerful organs of prehension are superadded to the suckers. Thus in the *Calamary* the base of the piston is, he remarks, inclosed by a horny hoop, the outer and anterior margin of which is developed into a series of sharp-pointed curved teeth. These, as he states, can be firmly pressed into the flesh of a struggling prey by the contraction of the surrounding transverse fibres, and can be withdrawn by the action of the retractor fibres of the piston. 'Let the reader,' adds the Professor, 'picture to himself the projecting margin of the horny hoop developed into a long, curved, sharp-pointed claw, and these weapons clustered at the expanded terminations of the tentacles, and arranged in a double alternate series along the whole internal surface of the eight muscular feet, and he will have some idea of the formidable nature of the carnivorous *Onychoteuthis*.

'Banks and Solander,' says Professor Owen in continuation, 'in Cook's first voyage, found the dead carcass of a gigantic species of this kind floating in the sea, between Cape Horn and the Polynesian Islands, in 30° 44′ S. lat., 110° 33′ W. long. It was surrounded by aquatic birds, which were feeding on its remains. From the parts of this specimen which are still preserved in the Hunterian Collection,* and which have always strongly excited the attention of naturalists, it must have measured at least six feet from the end of the tail to the end of the tentacles. The natives of the Polynesian Islands, who dive for shell-fish, have a well-founded dread and abhorrence of these formidable cephalopods, and one cannot feel surprised that their fears should have perhaps exaggerated their dimensions and destructive attributes.'

Professor Owen then notices another structure, which adds greatly to the prehensile powers of the uncinated Calamaries:—'At the extremities of the long tentacles, besides the uncinated acetabula, a cluster of small, simple, unarmed suckers may be observed at the base of the expanded part. When these latter suckers are applied to one another, the tentacles are firmly locked together at that part, and the united strength of both the elongated peduncles can be applied to drag towards the mouth any resisting object which has been grappled by the terminal hooks. There is no mechanical contrivance which surpasses this structure: art has remotely imitated it in the fabrication of the obstetrical forceps, in which either blade can be used separately, or, by the interlocking of a temporary joint, be made to act in combination.' (*Cyclopædia of Anatomy and Physiology*, vol. i.)



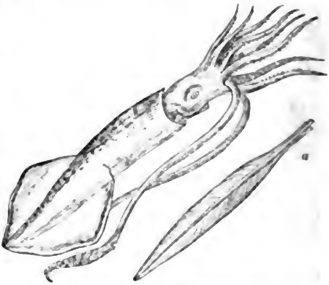
Onychoteuthis Banksii. a, gladius, or dorsal support.

Loligo. (Lam.)

Generic Character.—Body elongated, cylindrical, provided with a pair of rhomboidal or triangular fins, shorter than the body, and terminal, their apices generally converging to a point, and united to the end of the mantle; anterior margin of the mantle free. Horny hoops of the acetabula denticulated. *Gladius* long and narrow. (Owen.)

Example, *Loligo vulgaris*.

Pennant, under the name of *Sepia media*, describes this species, which is the common Calamary or Pen-fish (the latter name being derived from the form of its transparent gladius or support), as having an almost transparent body (which is green but convertible into a dirty brown, confirming the remark of Pliny,* that they change their colour, adapting it, chameleon-like, to that of the place they are in), and large smaragdine eyes. It is common upon our coasts.



Loligo vulgaris. a, its pen or internal support.

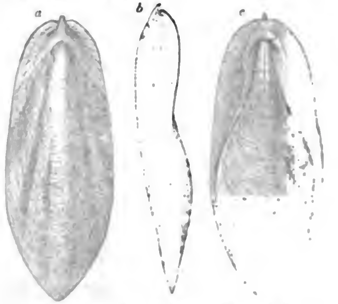
M. de Blainville gives *Loligo vulgaris* as the example of his genus *Pteroteuthis*.

Sepia. (Lam.)

Generic Character.—*Animal* with an oblong depressed body, with two narrow lateral fins extending its whole length; mantle free at its anterior margin; the acetabula supported by horny hoops with the margin entire or very minutely denticulated.

Shell internal, lodged in a sac on the back part of the mantle, composed of an external calcareous apex or *mucro*, of a succession of calcareous laminæ with intervening spaces filled with air, and supported by columns (but not perforated by a siphon), and an internal horny layer, corresponding to the anterior horny sheath in the BELEMNITES. (Owen.)

Example.—*Sepia officinalis*.



Internal shell of Sepia officinalis. a, view of back; b, side view; c, under side.

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* Mus. Coll. Chir.

* 'Nat. Hist.,' ix. 29.

This is the common Cuttle-fish, so well known on our coasts, and whose shell is so often thrown up by the waves on the beach.

The ink (nigræ succus loliginis*) is common to this and other species of cephalopods. [Cephalopoda, vol. vi., p. 425.] This fluid is not only ejected as a defence to colour the water in order to favour the escape of the animal, as was well known to the antients (Oppian, *Halieut.*, iii.; Pliny, *Nat. Hist.*, ix. 29), but as a direct means of annoyance. A gallant officer who was inconsiderately collecting shells in a pair of immaculate white trowsers, came suddenly upon one of the naked cephalopods snugly harboured in a recess in the rock. They looked at each other, and the cuttle, who had his eyes about him, and knew well how to use them, upon seeing the enemy advance, took good aim, and shot so true that he covered the snowy inexpressibles with the contents of his ink-bag, and rendered them unpresentable either in drawing-room or dining-room.

That the juice was used by the antients as ink is evident from many passages: we content ourselves with a reference to that above given, and to the lines in the graphic description of the idler by Persius. (*Sat.* iii., lin. 10, *et seq.*)

The flesh of the naked cephalopods was rather esteemed of old, as it is indeed now in Italy and other countries. Aristotle declares that these animals are in the highest season when pregnant,† and those who wish to taste a cuttle-fish sausage, will find a *receipt* for making that savoury viand in Athenæus. [Cephalopoda, vol. vi., p. 425.]

Mr. F. D. Bennett states that the *fe*, or cuttle-fish, is considered a luxury by all classes of the Sandwich Islanders, and that when fresh and well cooked it is an excellent food, and in consistence and flavour not unlike the flesh of a lobster's claw. (*Narrative of a Whaling Voyage round the Globe*, London, 1840.)

Independently of the swimming powers of the naked cephalopods, and their faculty of darting backwards in the water, they can, some of them at least, throw themselves out of the water and take leaps analogous to flights. Thus Pliny says, and not without ground for the assertion, 'Loligo etiam volitat, extra aquam se efferens, quod et pectunculi faciunt sagittæ modo.' (*Nat. Hist.*, ix. 29.) It is not improbable that one of the species, *Loligo Sagitta*, may have received its name from the rapidity with which this leap or flight out of the water is executed.

Mr. F. D. Bennett, who describes the sea as peculiarly animated between the latitudes 28° and 31° N. and the longitudes 154° and 160° W., observed that the ship was constantly attended by such vast numbers of the Albacore, that, when swimming, as is their custom, on the surface of the water, they could be seen as a dense shoal extending several hundred yards on every side of the ship, about which sword-fishes (*Xiphias*) frequently came, 'making destructive onslaughts' on the Albacores. More rarely he noticed the Barracuda, and transient shoals of Bonita. 'Flying-fish and (nearly allied to these in their movements) flying-squid (*Loligo*) were also numerous. During a calm, in lat. 30° N., the flying-squid appeared in larger flights than we had ever before witnessed; persecuted probably by the albacore (which select this tranquil time to descend deep in the water, and to rove far from the ship in quest of food), they rose from the sea in large flocks, leaping over its smooth surface, much in the same manner, and to the same height and distance, as the flying-fish. Many of them were captured by birds during their leaps; and one individual, in making a desperate effort to escape some aquatic pursuer, sprang to a considerable height above the bulwarks of the ship, and fell with violence upon the deck.' In the appendix, the *Flying-Squid* is again noticed. 'The head of this cephalopod,' says the author, 'is a plane circular disk, surrounded by long arms, furnished on their upper surface with many circular suckers, which hold with a tenacious grasp. The eyes are large, very perfectly formed, and lodged in spacious cartilaginous orbits. The mouth, like that of most of the cuttle-fish tribe, is horny, and shaped like the beak of a parrot. A slender neck connects the head to the body, and is received into the latter as into a capacious sheath. The trunk is conical, tapering to a point at the tail, smooth, and composed of a dense white cartilaginous structure covered with a delicate membrane or skin, beneath which are deposited the brilliant colours this mollusc often displays. Near the tail is a broad fin-like appendage, which can either be expanded horizontally on either side, or folded neatly upon the abdomen. The interior of the back contains an elastic horny rod, or substitute for the 'sepia bone,' that occupies the same part in some other tribes of the cuttle-fish. It extends the entire length of the body, and is flattened at its anterior extremity, whilst its caudal end is shaped like a cup; the whole bearing some resemblance to the instrument used for tasting wine from casks. This elastic structure and the membranous expansion on each side the tail are apparently the two principal agents employed by the animal in its protracted leaps through the air. Whether the fin-like appendage is also employed in swimming is very questionable.' 'One kind of *Loligo*,' captured in the Pacific Ocean, in lat. 34° N., which measured six inches in its entire length, must, from the description of its hooks, have been an *Onychoteuthis*. This individual leaped from the sea over the high bulwarks of the ship, and alighted on the deck at a time when vast flocks of the same species were seen leaping around, and often striking with violence against the bows of the vessel, the sea being comparatively smooth. It was much injured by the violence with which it struck the deck. Another species with its two long tentacles furnished at the extremities with rows of suckers (*acetabula*) instead of horny hooked appendages, resembling the above in size and form, was obtained in the Pacific. The prevailing colours were silver-white and steel-blue, spread with red spots and tints of violet and purple, a brilliant and very beautiful spot of emerald-green being placed immediately above each eye. Mr. Bennett concludes by stating that they noticed examples of this family of Cephalopoda from the equator to lats. 34° N. and 16° S. in the Pacific Ocean. (*Ibid.*)

The size of the naked cephalopods varies greatly. Some are of very large dimensions, and others—the *Sepiolæ* for instance—very small. Pennant relates that in the Indian Seas they are found of enormous size, and states that a friend of his, long resident among the Indian Isles, and a diligent observer of nature, informed him that the natives affirm that some have been seen two fathoms broad over their centre, and each arm nine fathoms long, adding that when the Indians navigate their little boats, they go in dread of them; and that, least these animals should fling their arms over them and sink them, they never sail without an axe to cut them off. Though there is doubtless exaggeration in some of the accounts relative to colossal cuttle-fishes, there is no doubt that some of the species attain to very formidable dimensions. We have seen the computed length of the *Onychoteuthis* found dead by Sir Joseph Banks; and even in the European seas some of the *Sepiadæ* are very large. Mr. Swainson (*Malacology*) remarks that he saw many caught on the shores of Sicily, and that two would be a good load, their arms being as thick as those of a man.

We must take with some grains of allowance the stories collected by Denys de Montfort: such as that of Dens, a northern navigator, who, according to Dr. Shaw, avowed that he lost in the African seas three of his men, while they were employed during a calm in scraping the sides of his vessel, by the attack of a monster of this kind, which suddenly appeared, seized them in its arms, and drew them under water in spite of every effort to save them, and that the thickness of one of the creature's arms, which was cut off in the contest, was that of a mizen-mast, whilst the suckers were of the size of pot-lids. Then again, another crew, it was alleged, were similarly attacked off the coast of Angola. A gigantic cuttle-fish suddenly threw its arms across the vessel, and was on the point of dragging it to the bottom, when the crew succeeded in cutting off its arms with swords and hatchets. When their danger was most imminent, they prayed to St. Thomas for aid, and, in gratitude for their deliverance, dedicated, on their return home, a picture representing their perilous encounter, to the saint in his chapel at St. Malo. Dr. Hamilton gives an engraving of this adventure in the volume on *Amphibious Carnivora*, in the 'Naturalist's Library,' and beneath it is printed, 'The Kraken, supposed a Sepia or Cuttle-fish (from Denys Montfort).' Dr. Shaw observes that the existence of some enormously large species of the cuttle-fish tribe can hardly be doubted; and that though some accounts may have been much exaggerated, there is sufficient cause for believing that such species may very far surpass all that are generally observed about the coasts of European seas. The last observation may be safely admitted; but the account given by Dr. Shaw of the narrative of Dens affords one of the many proofs that a story rarely loses anything in its progress. That narrative is sufficiently marvellous; but on turning to it as recorded by Denys de Montfort, we find that only two of Dens's men are stated to have been carried off; the third having been rescued, though he died delirious on the night following the encounter. The suckers are described as having been as large as ladles (cueiller à pot), and the arm, at its base, as big as a fore-yard (vergue d'un mât de misaine). In Shaw's lectures the yard is magnified to a mast, and the ladles are promoted to pot-lids. The notion that the celebrated *Kraken* is not to be considered as a wild and groundless chimera, but as either identical with or nearly allied to a colossal cuttle-fish, is supported in Blackwood's 'Magazine,' vol. ii. A writer in the same work, vol. iii., attacks the opinion attempted to be sustained in vol. ii.

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* Hor. 'Sat.,' iv. 100.

† 'Hist. Anim.,' viii. 30.

FOSSIL SEPIADÆ.

Professor Owen observes, that as it is certain that the animals of the *Belemnitidæ* [BELEMNITE] possessed the ink-bag, they must consequently have been invested with a muscular mantle, and we may therefore infer that they resembled the Dibranchiate Cephalopods in their locomotive and respiratory organs, and consequently in the general plan of their organization. In the structure and position of their siphoniferous camerated shell, they are, in his opinion, intermediate to *Spirula* and *Sepia*, and he adds, that as the animal of *Spirula* is proved to be a Decapod, the probability is very strong that the animal of the Belemnite was of the same type. (*Cyclopædia of Anatomy and Physiology.*)

In the secondary series of rocks (oolitic group) we find *Onychoteuthis augusta*, Münst. (*Loligo prisca*, Rüpp.), and a large Sepia (*Sepia antiqua*, Münst.; Rüpp.) in the Jurassic limestone of Solenhofen, commonly called the Solenhofen slate; and the remains of fossil *Loligines*, according to Dr. Buckland, with their ink-bags and ink preserved, in the lias of Lyme Regis. Also *Rhyncholites*, or Sepia beaks, in the last-mentioned formation (De la B.); and in the lias near Bristol. (Miller.)

Professor Buckland, in his interesting 'Bridgewater Treatise,' says, 'Cuvier drew his figures of the recent *Sepia* with ink extracted from its own body. I have drawings of the remains of extinct species prepared also with their own ink; with this fossil ink I might record the fact, and explain the causes of its wonderful preservation; I might register the proofs of instantaneous death detected in these ink-bags, for they contain the fluid which the living *Sepia* emits in the moment of alarm; and might detail further evidence of their immediate burial, in the retention of the forms of these distended membranes; since they would speedily have decayed and have spilt their ink had they been exposed but a few hours to decomposition in water. The animals must therefore have died *suddenly*, and been *quickly* buried in the sediment that formed the strata in which their petrified ink and ink-bags are thus preserved.'

Professor Agassiz, as we have stated [BELEMNITE, vol. iv., p. 173], is of opinion that these fossil ink-bags found in the lias belonged to belemnites. But still Dr. Buckland's argument remains untouched. The organ of sight in the Cephalopods generally, and in the naked group particularly, is extremely well developed [CEPHALOPODA, vol. vi., p. 425], and we therefore have in the remains of the Sepiadæ, which are preserved in the strata abovementioned, additional evidence that the antient seas in which they lived were constituted like those in which the cuttle-fishes and Squids (as the fishermen call the calamaries) now swim.

See further the articles BELOPTERA and BELOSÆPIA.

SE'PIOLA. [SEPIADÆ.]

SEPIOTE'UTHIS. [SEPIADÆ.]

SEPOY, or SIPOY, the name of the native soldier in the East Indies. Bishop Heber derives the word from 'sip,' the bow and arrow, which were originally in almost universal use by the native soldiers of India in offensive warfare. Those Bhiels and Kholees who are employed in Guzerat in the service of the police and in protecting gentlemen's houses and gardens are also called sepoys, and with more propriety, as they still use the bow and arrow. The native soldiers in the pay of the British government now form a large army, well trained in European discipline, of a size somewhat less indeed than European soldiers, but quite as brave, as hardy, and as active, capable of undergoing as much fatigue and of sustaining even greater privations. To the attachment and bravery of this army Great Britain is chiefly indebted for the possession of her Indian empire, and it now secures to her the undisputed sovereignty over a territory vastly more extensive than her own, and separated from her by the distance of nearly half the globe.

Bombay was the first possession which the English obtained in India, but the establishment on that island was for a long time on a very limited scale, and required nothing more than its own garrison and a few companies of native troops, who were peons, subject to little control, to no fixed military law, and who used their native weapons in preference to muskets. The French were the first to set the example of employing natives regularly instructed in European discipline. Labourdonnais, in the siege of Madras in 1746, had 400 sepoys well armed and well trained, besides 400 disciplined negroes from Madagascar, in addition to his European soldiers. A corps of 100 sepoys from Bombay and 400 from Tellichery are mentioned as having joined the army of Madras in 1747, but these were probably only peons and bands of undisciplined natives hired for the occasion. In 1748 a small corps of natives was raised in the neighbourhood of Madras, and trained and disciplined by Mr. Haliburton, a lieutenant. From 1748 to 1766 the sepoys were in separate companies of 100 each, commanded by subadars, or native captains, though under the superintendence of Europeans. In 1766 the companies were formed into battalions of 1000 men each, commanded by European officers, under whom the subadars still retained their rank and influence. In 1796 two battalions were made to constitute a regiment, which continued to be the form till about 1820, since which time each regiment has been made to consist of two battalions of 500 men each.

Bombay, in 1780, during the war with the Mahrattas, had fifteen battalions of sepoys, of 1000 men each, which, at the conclusion of the war, were reduced to six battalions and one of marines. In 1788 there were twelve battalions, which, in 1796, were reformed into four regiments of two battalions each. In 1818 the Bombay establishment consisted of nine regiments of native infantry of two battalions each, one battalion of marines, and a small corps of native cavalry.

The Madras establishment, in 1766, consisted of ten battalions of sepoys, of 1000 men each. In 1770 there were eighteen battalions; in 1784, twenty-eight battalions of infantry and two of cavalry; in 1818, twenty-four regiments of native infantry, of two battalions each, eight regiments of native cavalry, several troops of horse artillery, and a large invalid establishment.

Of the progress of the native army on the Bengal establishment we have no precise details. It may be mentioned however that in 1778, when assistance was required at Bombay, a corps of Bengal native cavalry and a proportion of artillery, amounting to 6600 native troops, 103 European officers, with 31,000 followers, marched from Cawnpoor, on the banks of the Jumna, to Surat, upwards of 800 miles, through Bundelcund, Malwa, and Candeish, where they had to encounter every species of obstacle and opposition. Another force of Bengal native troops, consisting of five regiments, of two battalions of 500 men each, were marched about 1100 miles through Cuttack and the Northern Circars to Madras, where their assistance was required to preserve our power in that quarter.

The pay of the Sepoy is high, two pagodas, or seven rupees, per month, which is double the wages of the class of persons from whom they are generally drawn.

The Indian army in 1840, according to the 'East India Calendar,' was as follows:—

Bombay.

26 regiments of native infantry.
3 regiments of native cavalry.
2 regiments of European infantry.
1 regiment of artillery.
1 corps of engineers.
1 corps of invalids.

Madras.

52 regiments of native infantry.
8 regiments of native cavalry.
2 regiments of European infantry.
1 regiment of horse artillery.
4 regiments of foot artillery.
1 corps of engineers.
1 corps of invalids.

Bengal.

74 regiments of native infantry.
10 regiments of native cavalry.
2 regiments of European infantry.
1 regiment of horse artillery.
5 battalions of foot artillery.
1 corps of engineers.
1 corps of invalids.

The native troops in the pay of the British government may therefore be roughly estimated at 152,000 infantry and 21,000 cavalry, the total number, including artillery, engineers, &c., being probably about 184,000.

SEPS. [Scincoideans, vol. xxi., p. 76.]

SEPTEMBER, the ninth month, as the year is now divided by European nations. It consists of 30 days. Etymologically the name is improper, being a Latin term formed of *septem*, seven, and the termination *ber;* and the same impropriety belongs to October, November, and December. The Roman year originally commenced in March; and the English names of the months, which are all Latin terms, appear to have been given to them by the lawyers, whose writings were formerly in Latin, and who supposed the year to commence in March, on which supposition the names are right, September being the seventh, October the eighth, &c., when March is the first. The legal year in England was not made to commence on the 1st of January till the alteration of the style in 1752. Most of the other nations of Europe apply the same or a similar name to this month—German, *September;* French, *Septembre;* Italian, *Settembre;* Spanish, *Septiembre.* In Switzerland September is called *Herbstmonat*, the autumnal or harvest month.

Other appellations were given to this month under some of the Roman emperors. The Saxons called it *Gerstmonath*, or barley-month, gerst being the original Saxon name for barley, which was the chief grain cultivated by the Saxons, and commonly harvested in this month. *Gerste* is still the German name for barley, which name seems to be a corruption of *beerlegh*, a term which the Saxons applied to the grain from its use in making beer.

SEPTUAGE'SIMA. [Sexagesima.]

SEPTUAGINT, or THE ALEXANDRINE VERSION OF THE OLD TESTAMENT, the most antient translation of any part of the Scriptures. It is in the Greek language. The following account of its origin is given in a letter ascribed to Aristeas, an officer at the court of Ptolemy Philadelphus, and repeated by Josephus (*Antiq.*, xii., c. 2) and Eusebius (*Præpar.*, Evang. viii., c. 2-5). When Ptolemy Philadelphus had founded the great library at Alexandria [Ptolemæus II., p. 101], he was anxious to have in it a copy of the laws of the Jews. By the advice of Demetrius Phalereus, his principal librarian, he sent Aristeas and Andreas to Jerusalem, with valuable presents for the Temple, to request the high-priest to send him a genuine copy of the law, and seventy-two elders competent to translate it into Greek, six out of each tribe. The high-priest complied with his request. Upon the arrival of the translators at Alexandria, the king entertained them splendidly, and then had them conveyed to a house prepared for them in the island of Pharos, where, in the space of seventy-two days, they finished a version of the Pentateuch, to the complete satisfaction of Demetrius and Ptolemy, and also of the Jews in Alexandria. Philo, Justin, and Epiphanius repeat this story, but exaggerated by traditions which ascribe a miraculous accuracy to the translation. The name *Septuagint* (the version of the seventy) is derived from the number of the translators. The genuineness of the letter of Aristeas, and consequently the truth of the whole story, is very doubtful, and is now generally rejected. Most critics imagine that the version of the Pentateuch was made during the reign of Ptolemy Soter, and between the years 298 and 285 B.C., for the benefit of the Jews whom Ptolemy had carried into Egypt (B.C. 320), and probably under the patronage of the king; and that the name *Septuagint* is derived from the circumstance of the version having been approved by the Sanhedrim of the Alexandrian Jews. It is evident from the style of the version of the remaining books of the Old Testament, that they were translated by different hands and at different times. That the translators of the Septuagint were Egyptians, is evident from the Coptic words which occur in the version.

Philo says that the Septuagint was translated from the Chaldaic, by which he means the Hebrew Scriptures as they existed after the Captivity. But from certain points of resemblance between the Septuagint and the Samaritan Pentateuch, many eminent critics have concluded that the former was translated from the latter, and not from the Hebrew. It is however quite incredible that, if this had been the case, the Septuagint should have been, as it was, universally received by the Jews.

The character of the version varies greatly. By far the best part is the version of the Pentateuch, which was evidently made by a man well acquainted with both Hebrew and Greek. Next in value is the book of Proverbs, which is for the most part very accurate, and displays much poetical taste. The translation of Ecclesiastes is too literal. The books of Judges, Ruth, Samuel, and Kings appear to have been translated by the same author, and do not contain so many Hebraisms as other parts of the version. In the book of Job many interpolations are made in the narrative, and there are considerable omissions in the poetical parts. The book of Esther, and the Psalms and Prophets, appear to have been translated between 180 and 170 B.C., but in a very inferior manner: indeed a great part of the version of the Psalms is quite unintelligible. Jeremiah is the best translated of the prophets; next come Amos and Ezekiel. The version of Isaiah, which Lowth places one hundred years later than that of the Pentateuch, is the worst of all, except that of Daniel, which differs so much from the Hebrew, that the early Christians rejected it altogether, and substituted the version by Theodotion in its place. The Septuagint contains also the apocryphal books of the Old Testament. [Apocrypha.]

The Septuagint was used not only by the Hellenistic Jews, but by all Jews who understood Greek; and even some of the Talmudists mention it with praise. It is constantly quoted by Josephus, and very frequently by the writers of the New Testament.

Soon after the Christian æra however we find the opinion of the Jews respecting it very much altered, probably in consequence of the use made of it against them by the Christians. They went so far as to institute a solemn fast on the 8th of the month Thebet (December) to execrate the memory of its having been made, and afterwards a new version, that of Aquila, was made for the express purpose of superseding the use of the Septuagint in the synagogues. [Aquila.] The fathers of the Greek church always quote the Septuagint. All the early versions, except the Syriac, were made from it. And thus, through the Vulgate, it was used in the Latin as well as in the Greek church. Its text having become corrupted by frequent transcription, Origen undertook to revise it, and produced his celebrated *Hexapla.* [Origenes.]

At the end of the third and the beginning of the fourth centuries, three recensions of the text of the Septuagint were produced. The first was undertaken by Lucian, a presbyter of Antioch, who suffered martyrdom, A.D. 311. This edition was conformed to the Hebrew text, and was received in the churches from Antioch to Constantinople. The second was edited at the same time by Hesychius, an Egyptian bishop. It is not known whether he followed the Hebrew text or antient MSS. of the Septuagint; but his alterations appear to have been fewer than those of Lucian. His edition was received by the churches of Egypt, and is cited by Jerome as the *Exemplar Alexandrinum.* The third was transcribed by Eusebius and Pamphilus from the text in the Hexapla, with the whole of Origen's critical marks. In process of time these marks became so altered by frequent transcription, that they were at length altogether omitted, so that it is now impossible to distinguish Origen's emendations from the original text. This edition was received by the churches of Palestine, and had a place in all libraries. All the subsequent editions of the Septuagint are founded upon these three recensions.

The principal modern editions of the Septuagint are: 1, The Complutensian, A.D. 1514-1517. [Polyglotts.] 2, The Aldine, Venice, 1518. 3, The Roman, after the Vatican Codex, 1586. 4, The edition of Bos, after the Vatican Codex, with various readings and a critical preface, 1709. Mill's edition, Amsterdam, 1725, is founded on the text of Bos. 5, Grabe's edition, after the Alexandrine Codex in the British Museum, with Prolegomena, Oxford, 1707-1720. 5, Breitinger's edition, reprinted and re-edited from Grabe's, 1730-32. 6, The most valuable and splendid edition is that of Holmes and Parsons, 5 vols. fol., Oxford, 1798-1827. In all these editions, except the last, the version of Daniel is that of Theodotion. The Septuagint version of Daniel was supposed to have been lost till the year 1772, when it was discovered and published at Rome. It was reprinted at Göttingen in 1773 and 1774, and by Dr. Holmes at Oxford in 1805. The best of the smaller editions of the Septuagint are those of Mill, Amst., 1725; Valpy, London, 1819; and Von Ess, Leipzig, 1824. A splendid facsimile of the Alexandrine Codex of the Septuagint has been edited by the Rev. H. H. Baber, 4 vols. fol., Lond., 1816-1820. [ALEXANDRIAN CODEX.]

For an account of the other Greek versions of the Old Testament, see AQUILA; SYMMACHUS; THEODOTION. (The *Introductions* of Horne and Jahn, and the authorities quoted by them.)

SEPU'LVEDA, JUAN GINE'S DE, an eminent Spanish scholar and historian, was born at Pozoblanco near Cordova, in 1490. After pursuing his studies, first in Cordova and then at the university of Alcalá, he embarked for Italy in June, in 1515, and reached Bologna, where he obtained admission into the college founded by cardinal Albornoz. There he made rapid progress in theology and the learned languages under the guidance of the celebrated Pomponazzi (Peter), translated part of Aristotle, and wrote the Life of Cardinal Albornoz: 'De Vita et Rebus Gestis Ægidii Cardinalis Albornotii,' lib. iii., Rome, 1521, fol. Sepulveda afterwards went to Rome, where he found a protector in cardinal Carpi, who gave him a lodging in his palace. Thence he passed to Naples, where he assisted cardinal Caetano in revising the Greek text of the New Testament. In 1529 Sepulveda returned to Rome and entered the service of cardinal Quiñones; but in 1536, having been appointed chaplain and historiographer to Charles V., he quitted Italy and arrived in Spain, where he was entrusted with the education of the eldest son of that emperor, afterwards Philip II. About this time, Bartholomé de las Casas, bishop of Chiapa, so celebrated for his endeavours to alleviate the sufferings of the Indians, was pleading their cause at court with all the zeal and fervour of a true philanthropist. Sepulveda, having been prevailed upon by the enemies of Las Casas to refute his arguments, wrote a book, entitled 'Democrates Secundus, seu de Justis Belli Causis,' &c., in which he undertook to prove that the wars of the Spaniards in America were just, and founded on their right to subdue the inhabitants of a world discovered by them; that it was the duty of the Americans to submit to be governed by the Spaniards on account of their superior knowledge and wisdom; and that if they would not voluntarily acquiesce in the Spanish yoke, they might and ought to be compelled to do so by force of arms. He further declared that his only object in writing that work was to establish the rights of the kings of Castile and Leon over America. This work however was never printed, for when Sepulveda applied to the Royal Council for permission to print it, it was refused, and the book itself was condemned by the universities of Alcalá and Salamanca, to which the case was afterwards referred. Upon this Sepulveda wrote his 'Apologia pro Libro de Justis Belli Causis contra Indos suscepti,' which appeared at Rome in 1550, 8vo.; but the edition was seized by order of Charles V., and but few copies were saved. Sepulveda died in 1574, at the age of 83.

Sepulveda was a man of great learning. Erasmus speaks of him in the 'Ciceronianus,' and classes him among the best writers of his time. Besides his Latin translation of part of Aristotle, which appeared at Paris, 1531, fol., and that of the Commentary of Alexander of Aphrodisias upon the same, which he had previously printed at Rome, 1527, fol., Sepulveda left the following works:—'De Fato et Libero Arbitrio Libri Tres,' Rome, 1526, 4to., being a refutation of Luther's opinions on fate; 'Ad Carolum V. Cohortatio ut factâ cum omnibus Christianis Pace, Bellum suscipiat in Turcas,' Bolonia, 1529, 4to.; 'Antapologia pro Alberto Pio in Erasmum,' Paris, 1531, 4to. (this was written in defence of cardinal Carpi); 'De Ritu Nuptiarum et Dispensatione Libri Tres,' Rome, 1531, and London, 1553, 4to.; 'De Convenientia Militaris Disciplinæ cum Christiana Religione.' In this work, written in the form of a dialogue, and dedicated to the celebrated duke of Alba, the author undertakes to prove that the profession of arms is in harmony with the doctrines of Christianity. It was translated into Spanish by Barba, Sev., 1541, 4to. 'De Appetenda Gloria;' 'De Ratione dicendi Testimonium in Causis Occultorum Criminum.' Vallad., 1538, 4to.; 'De Regno et Regis Officio,' Lerida, 1571, 8vo. A history of the reign of Charles V., another of that of Philip II., and a narrative of the conquests of the Spaniards in Mexico, all three works in Latin, are still inedited. Sepulveda's works were collected and published, with the exception only of his translations, at Cologne in 1602. They have since been reprinted, in 1780, at Madrid, by the Royal Academy of History, in four volumes, folio., with a portrait of the author and an account of his life and writings.

There is another Spanish writer named (SEPULVEDA LORENZO), who flourished about the same time, and gained considerable reputation as a writer of romances. He published 'Romances sacados de Historias Antiguas,' Antw., 1551, 8vo., and 1580, 8vo.; 'Romances sacados de la Historia de España del Rey Don Alonso,' Medina, 1562, 8vo., Antw., 1580, 8vo.; 'Otros Romances sacados de la Historia y de los Quarenta Cantos de Alonso de Fuentes,' Burgos, 1579, 12mo.; 'Cancionero de Romances,' Vallad., 1577, 12mo.

SEQUESTRATION is a process by which the revenues of an ecclesiastical benefice are received and applied by persons other than the incumbent of it. It issues immediately from the bishop in all cases, but it may be founded upon proceedings commenced either in his own court or in the temporal courts. It is a mandate, in the nature of a warrant, addressed by the bishop to the parties who are to execute it. These are called sequestrators, and in general are the churchwardens of the parish. So far as regards their duties under the sequestration, they are a kind of bailiffs. They collect the fruits of the benefice, and apply them according to the directions they receive in each case. It is said to be most proper for them to receive the tithe in kind. They cannot however maintain an action for the tithes in their own name in any except the spiritual court.

The occasions on which a sequestration is founded on proceedings in the court of the bishop are various. There may be a sequestration where a living is vacant by death; in such case the object of the sequestration is to provide for the expenses of supplying the cure, and to preserve the surplus for the successor. Where the living is so small that no fit clergyman will be at the charge of taking it, the sequestration is sometimes addressed to the curate as well as to the churchwardens. Where the title to a living is in dispute, a sequestration may issue under which some third party collects the fruits, and, after defraying the salary of the curate and other necessary expenses of the benefice, retains the surplus for the party who may appear to be lawfully entitled. There are many occasions also where the bishop acting judicially may sequester a living, as where the parsonage-house is in decay, and the incumbent, after due admonition, which may be made by the archdeacon, fails for a period of two months to repair it. Under the statutes 17 Geo. III., c. 53, and 1 and 2 Vic., c. 106, the bishop is also empowered to sequester a living where the incumbent fails to insure the parsonage-house, or to pay the principal and interest of the money raised on mortgage under the authority of those acts. The latter act also gives the bishop the same authority on many other occasions, as where the incumbent has been engaged in trade, contrary to the provisions of that act, or has failed to comply with an order from the bishop enjoining residence, or, in case of non-residence, has failed duly to surrender to the curate the residence house and glebe assigned to him by the bishop under the act, &c. The payment of a curate's salary may also be enforced by sequestration. The statute of Victoria contains a number of regulations as to the application of the revenues collected under the sequestration.

Sequestrations founded on proceedings in the temporal courts occur under the following circumstances:—The sheriff, the ordinary ministerial officer of those courts, has no power to interfere with ecclesiastical revenues. When a judgment therefore has been obtained against a beneficed clergyman, and a writ of levari or fieri facias has issued upon it, addressed to the sheriff within whose bailwick the benefice is, and the clergyman has no lay property upon which the sheriff can levy, he makes a return that the defendant is a beneficed clerk having no lay fee within his bailwick. The plaintiff may then sue out a writ of fieri facias, addressed to the bishop, directing him to levy the amount upon the clergyman's ecclesiastical goods. The bishop upon this, by his registrar, issues a sequestration, directing the sequestrators to levy the debt upon the tithes and other profits of the benefice; or the plaintiff may sue out a sequestrari facias, addressed to the bishop. The bishop, under these circumstances, is said to be a kind of ecclesiastical sheriff; and the temporal courts, in so far as relates to his duties as such ministerial officer, have the same power over him as they have over the sheriff, and his duties are analogous. [SHERIFF.] The sequestration ought to be forthwith published by reading it in church during divine service, and afterwards at the church-door. The party obtaining it may, on giving proper security, name his own sequestrators. Under either of those writs the plaintiff is entitled to the growing profits, until the whole sum endorsed upon it is satisfied, even although this should not occur till after the time at which the writ is returnable. The necessary expenses of the sequestration, &c. are also leviable under the writ. The lands are bound from the time of the delivery of it to the bishop. A sentence of sequestration may be appealed against, and during the lawful prosecution of the appeal the incumbent may enjoy the profits. (Burn's *Ecclesiastical Law*; Rogers's *Ecclesiastical Law*.)

Sequestration in chancery is a 'writ issuing out of the court, directed to four or more commissioners, empowering them to enter into a defendant's real estates, and to sequester into their own hands not only the rents thereof, but also all his goods, chattels, and personal estate whatsoever, to keep the same until the defendant has fully answered his contempt.' It is the first process against peers or members of parliament, the Warden of the Fleet, or persons in his custody. As regards other persons, it issues upon the occasion of their committing a contempt against the court, by keeping out of the way of the serjeant-at-arms or escaping from his custody, neglecting to put in an answer, failing to perform a decree, &c. A conditional order for a sequestration is obtained by application to the court, founded on an affidavit of the facts. If a sufficient cause is not shown to the contrary, within eight days after service of the order, it will then be made absolute.

A sequestration binds from the time of awarding it, not from the time of execution only. If, before it has been awarded, the defendant has fraudulently conveyed away his land, the sequestration may be awarded against him and his assigns.

A sequestration in mesne process, if it be for a personal duty, determines by the death of the party; or the defendant, by clearing his contempt and paying the costs, may discharge the sequestration. The commissioners under a writ of sequestration have authority to break open doors. Where it is upon mesne process, it may be executed, in the case of land, by making the tenants pay their rent to the sequestrators, or by a sale of goods sufficient to cover the sequestrators' expenses; but the sale must be by the court, and after notice. The sequestrators must account for what they receive, and bring the money into court to be repaid to the defendant on clearing his contempt, subject to their fees. The process of sequestration is said to have been introduced by Lord Bacon. (Com., *Dig.*, tit. 'Chancery,' D 7; Y 4.)

SEQUIN. [MONEY.]

SERA'GLIO, properly *seraï*, the palace of the emperor of Constantinople; in this sense the word is also applied to the houses of foreign ambassadors resident at his court. The seraï of Constantinople stands in a beautiful situation, on a head of land projecting into the sea, formerly called Chrysoceras, or the Horn of Gold, now Seraglio Point. The walls embrace a circuit of about nine miles, including several mosques, spacious gardens, and buildings capable of accommodating 20,000 men. The walls are flanked at intervals by watch-towers, and have several gates opening to the sea or to the city. Its outward appearance from the sea is very fine; but from the land side the domes and gilded cupolas of its various buildings are concealed from the eye by a lofty wall. The principal gate, called Babi Humayum (Sublime Porte), is constantly guarded by a detachment of the body-guard. That part of the building which is occupied by the women of the sultan has been improperly called *seraglio*, and hence the word has become synonymous with *harem*, an Arabic word, meaning 'sacred spot,' or that part of the house where the women and daughters of the Mohammedans reside.

SERAI, a large building for the accommodation of travellers, common in Eastern countries. The word is Persian, and means in that language, 'a palace, the king's court, a large edifice;' hence *karávân-seraï*, by corruption *caravanserie*, i.e. place of rest for caravans. In Turkey these buildings are generally called *khans*, from *khân*, another Persian word, which has a similar meaning. In Tartary and India they are simply called *seraïs*. The erection of these buildings is considered highly meritorious by Hindus as well as Mohammedans, who frequently endow them with rents for their support. [SERAGLIO.]

SERAMPORE is a small town in Hindustan, built on the western banks of the Hoogley river, about 12 miles above Calcutta, in 22° 45′ N. lat. and 88° 26′ E. long. It extends nearly a mile along the river, but is of very small breadth. This town is built in the European fashion, and belongs to the Danes, who however do not derive any advantage from it, as the commerce of Denmark with the East Indies is small, and is mostly concentrated in the town of Tranquebar on the coast of Coromandel. Serampore has acquired some celebrity as being the principal place where the missionaries for converting the natives to the Protestant religion have been established. They have set up a press, in which numerous translations of the Bible have been printed. There is a college for instructing youths in the European and Asiatic languages, in mathematics, and natural philosophy, and also a school for the instruction of the natives, whatever religion they profess. In 1824 this place was almost ruined by an extraordinary inundation of the Hoogley. The inhabitants are about 13,000. The Danes obtained possession of Serampore in 1676. It was taken from them by the English during the war between the two countries, but was restored at the peace of 1814. (Lord Valentia's *Voyages and Travels to India, Ceylon, &c.*; and Bishop Heber's *Narrative of a Journey through the Upper Provinces of India, &c.*)

SERA'PION (Σεραπίων), an eminent physician of Alexandria, in the third century B.C., who belonged to the sect of the Empirici, and who so much extended and improved the system of Philinus, that the invention of it is by some authors attributed to him. (Celsus, 'De Medic.,' lib. i., praefat.)

Dr. Mead, in his 'Dissert. de Numis quibusdam à Smyrnaeis in Medicorum Honorem cusis' (p. 51), believes that he was a pupil of Erasistratus, because his name appears upon a medal discovered at Smyrna, and because the followers of that celebrated anatomist lived in that town; but as the empress Eudocia (Violar. apud Villoison, 'Anecd. Graec.,' tom. i., p. 381) mentions a rhetorician of Ælia Capitolina (Jerusalem) in Palestine who bore the same name, one would have quite as much right (says Sprengel) to reckon Serapion among the rhetoricians, if Hadrian, the founder of the town of Ælia, had not lived much later than the time of Serapion.

Serapion wrote against Hippocrates with much vehemence, and occupied himself almost exclusively with researches into the nature of drugs. (Galen, 'De Subfigur Empiric.,' cap. 13, p. 68, ed. Bas.)

Coelius Aurelianus ('De Morb. Acut.,' lib. ii., cap. 6, p. 84) quotes his book 'Ad Sectas,' finds fault with the severe remedies that he prescribed in 'Angina Pectoris,' and reproaches him with having neglected *dietetics*. (*Ibid.*, lib. iii., cap. 4, p 195.) One may presume that in those early times a great many superstitious remedies were used for epilepsy; for Serapion, besides castoreum, recommended also the *brain of the camel*, the rennet of the sea-calf, πυτιά φώκης, the excrements of the crocodile, the heart of the hare, the blood of the tortoise, and the testicles of the wild-boar. (Coel. Aurel., 'De Morb. Chron.,' lib. i., cap. 4, p. 322.) Several authors make mention of some other preparations and antidotes, which bear his name, and which are scarcely worth more than those above mentioned. (Celsus, 'De Medic.,' lib. v., cap. 28, sect. 17, p. 307; Aëtius, tetrab. ii., serm. ii., cap. 96, col. 296; Nicolaus Myrepsus, 'Antidot.,' sect. i., cap. 66, col. 375.)

SERAPION, a Syrian physician, called by Wüstenfeld ('Gesch. der Arab. Aerzte'), *Yahia Ibn Serapion Ben Ibrahim*, and commonly called Serapion Senior, to distinguish him from another physician of the same name, with whom he is sometimes confounded. Nothing is known of the events of his life, and the century in which he lived is only to be calculated from his being quoted by Rhazes, who died probably A.H. 320 (A.D. 932). We are told by the anonymous author of the 'Arab. Philosoph. Biblioth.,' quoted by Casiri ('Biblioth. Arabico-Hisp. Escur.,' tom. i., p. 261), that 'duo de Re Medica edidit volumina, id est *Collectionem Magnam* Libris XII., et *Collectionem Parvam* Libris VII. comprehensam, utramque Syriacè: quam in Arabicum Sermonem convertere Musa Ben Abrahim Alhodaithi, et Ben Bahlul.' We possess two works that bear his name; one still in MS., called 'Aphorismi Magni Momenti de Medicina Practica'

(Uri, 'Catal. Codd. MSS. Orient. Biblioth. Bodl.,' No. 598); the other, entitled *Kunnásh*,[*] has been translated into Latin, and published under the various names, 'Pandectæ,' 'Aggregator,' 'Breviarium,' 'Practica,' and 'Therapeutica Methodus.' Dr. Russell (Append. to 'Nat. Hist. of Aleppo') says that the only MS. of this work that he had seen in the European catalogues was that of the Escurial (Cod. 814), which however contains only a small part of it; and that he had never met with any of this author's works in the East. The object of the work is to collect and put together in an abridged form the opinions of the Greek and Arabic physicians concerning diseases and their treatment. 'As Haly Abbas ('Lib. Reg.,' Prol.) remarks,' says Mr. Adams (Appendix to Barker's ed. of Lempriere, London, 1838), 'he treats of the cure of diseases solely as practicable by medicine and diet, and has entirely omitted *hygiene* and *operative surgery*. The list of the complaints of which he treats is far less complete than those of Rhases, Haly, and Avicenna, and in particular it is remarkable that he makes no mention of *elephantiasis*, *aneurism*, and *diseases of the chest and genital organs*; his description of *small pox*, as further stated by Haly, is very incomplete.' Dr. Freind remarks ('Hist. of Physic,' vol., ii., p. 42), that he often transcribes out of Alexander Trallianus, an author with whom few of the other Arabic writers seem to have been much acquainted.' A fuller account of Serapion's medical opinions may be seen in Freind (*loc. cit.*), Haller ('Biblioth. Med. Pract.,' tom. i., p. 443), and Sprengel ('Hist. de la Med.,' tom. ii., p. 277).

The first edition of his work mentioned by Choulant ('Handbuch der Bücherkunde für die Aeltere Medicin') is the translation by Gerardus Cremonensis, printed in black letter in double columns, fol., Venet., 1479, by Rainaldus Noviomagensis Alemannus, with the title, 'Jo. fil. Serapionis Opera, s. Breviarium etc. et (Serapionis Junioris) Liber Aggregatus in Medicinis Simplicibus ex transl. Sim. Januensis interprete Abraam Judaeo Tortuosiensi, etc.' The last edition mentioned by Choulant is a reprint of the translation of Andreas Alpagus (which was first published in 1488, fol., Ferrar.), Venet., 1550, fol., with the title, 'Jo. fil. Serapionis Practica,' &c., and with the work of the younger Serapion in the same volume. Albanus Torinus published an edition (Basil., 1543, fol.), with the title, 'Jani Damasceni Therapeutica Methodi Lib. VII.,' &c., which alteration of the author's name has increased the confusion that already existed respecting him. An extract from his work is printed in Fernel's Collection of the Greek, Latin, and Arabic writers 'De Febribus,' Venet., 1576, fol.

SERAPION, commonly called Serapion Junior, to distinguish him from the preceding, an Arabian physician of whom nothing is known. He must certainly have lived after Ibn Wafid (commonly called Albenguefit or Abenguefit), since he quotes him, and as that author died A.H. 460 (A.D. 1068), Serapion may perhaps be placed at the end of the fifth century after the Hegira, or the eleventh after Christ. There remains a work by him, 'De Simplicibus Medicamentis,' of which there is an Arabic MS. in the Bodleian Library at Oxford (Uri, 'Catal. MSS. Orient.,' No. 597), but which has only been published in a Latin translation. 'This is,' says Mr. Adams (Appendix to Barker's Lempriere, Lond., 1838), 'one of the most important works of Arabic medical literature, and contains a useful compendium of all the most interesting information on this head in the writings of Dioscorides and Galen, with some additional remarks by himself and the older Arabic authorities; the most original part of it is the *Introduction*, in which he classifies substances according to their medicinal properties, and gives an ingenious dissertation on their actions. On the whole, he has made very few additions to the articles in the Materia Medica of the Greeks, and indeed sometimes gives to his Grecian masters credit for the discovery of certain medicinal substances, for which it would rather appear that we are indebted to his countrymen. Thus, in his chapter on *Serina*, he quotes Paulus Ægineta, but seemingly by mistake, for no account of this purgative is now to be found in the works of the latter. Where all is mostly unexceptionable, and there is nothing remarkably original, it is difficult to point out any subject which is handled in a more interesting manner than the others. I would refer however to his account of squills: he says that the *Vinum scilliticum* is given as a laxative in fevers, and in dropsy as a diuretic, to remedy indigestion, for jaundice and *tormina* of the belly, for an old cough, asthma, and spitting of blood, and for cleansing the breast of gross humours; and forbids the use of it when there is an ulcer in an internal organ.' There are however abundant proofs of his credulity and love of the marvellous in his accounts of the bezoar (cap. 396, p. 188, a.), diamond (cap. 391, p. 187, b.), asphaltus (cap. 177, p. 147, a.), &c. 'Amber,' says he (cap. 196, p. 150), 'grows in the sea like mushrooms on land. In China there are some persons solely engaged in fishing for this substance. That which floats on the sea is swallowed by the whale, and quickly causes its death. When the animal's body is opened, the best amber is found near the vertebral column, and the worst in the stomach.'

The first edition of this work mentioned by Choulant ('Handbuch der Bücherkunde für die Aeltere Medicin') was published at Milan, 1473, fol. in black letter, with the title, 'Liber Serapionis aggregatus in Medicinis Simplicibus, translatio Simonis Januensis interprete Abraham Judaeo Tortuosiensi de Arabico in Latinum.' The last edition mentioned by him was published at Venice, 1552, fol., with the title, 'Serapion de Simplic. Medicam. Historia Libri VII., Nicol. Mutono interprete.' It has been often printed in the same volume with the work of the elder Serapion, as for a long time they were supposed to be written by the same person.

SERA'PIS (Σάραπις) was an Egyptian divinity. Among the Greek writers who mention him, some consider him to be the same with Osiris; others think that he was the same as Dionysus, Pluto, Ammon, Zeus, or Pan. (Diod., i. 25; Plut., *De Is. et Os.*, p. 361, &c.) The name Serapis is probably of Egyptian origin, and signified, according to Plutarch, 'joy' (χαρμοσύνη). Macrobius (*Sat.*, i. 20) identifies this god with the sun. The impossibility of reconciling the accounts respecting the antient Egyptian Serapis and those respecting a divinity of the same name whose worship became very general at a later period, has led Jablonsky (*Pantheon*, vol. i.) to distinguish two gods of the name of Serapis, an antient and a more recent one. The antient Serapis, according to him, represents the sun in the winter signs of the zodiac; and at the same time the god of the swelling Nile, and as such he bore a calathus on his head to indicate the rich harvest produced by the fertilising inundation of the Nile. He had temples (Serapeia) in several parts of Egypt; the most antient was that of Memphis, but others were erected at Thebes and Alexandria. The form in which the god was represented is described by Macrobius.

The worship of the more recent Serapis was said to have been introduced into Egypt from Sinope in the reign of the first Ptolemæus (Plut., *De Is. et Os.*; Tacit., *Hist.*, iv. 84); it was adopted in several parts of Greece, as at Athens (Paus., i. 18, 4), at Copæ in Bœotia, and at Syracuse. (Cic., *c. Verr.*, ii. 66.) When a regular intercourse between Egypt and Rome became established, some private Romans erected altars to Serapis and other Egyptian deities. But in 58 B.C. the Roman senate forbade the worship of the Egyptian gods, and ordered their altars and temples to be demolished. (Dion Cass., xl. 47.) The people however seem to have been so much taken with the Egyptian gods, that the command of the senate was ineffectual, and new temples were soon erected, so that in the year 50 B.C. the senate issued a second decree that the temples should be demolished. (Dion Cass., xlii. 26; Val. Max., i. 3. 3.) But in 43 B.C. the senate was obliged to allow the building of a new temple of Isis and Serapis in the Circus Flaminius (Dion Cass., xlvii. 15); and henceforth their worship remained unmolested. This temple was magnificently adorned by the emperor Alexander Severus. (Lamprid., *Al. Sev.*, 26.) Serapis was considered by the Romans as the god of the healing art, and he was supposed to cure sick persons if they passed a night in his temple. (Cic., *De Divin.*, ii. 59; Varro, *Fragm.*, p. 276, Bip.) The head of Serapis is represented in many antient works of art; his features are peculiarly mild and soft, but are expressive of a mysterious reserve. On the Egyptian monuments no figure has yet been discovered which might with certainty be regarded as a representation of Serapis. At Alexandria the worship of Serapis was abolished in the reign of Theodosius the Great, by the archbishop Theophilus. (Suidas, *s. v.* Σάραπις.)

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[*] The word Kunnásh is thus explained in the Kámús: 'Kunnáshat are the roots from which the branches spread themselves.' The meaning of the word here appears to be a book of collections of recipes and observations which a physician makes during the course of his practice. At least in the enumeration of the works of the different physicians, Syrians especially, who are mentioned in the work of Ibn Abi Osaibia, almost every one is said to have composed a Kunnásh. The work is probably derived from a Syriac one which means 'to collect.' (Note by the Rev. William Cureton, in the 'Asiatic Journal.')

SERCQ, or SERK. [Guernsey.]

SERENADE, a word adopted from the French *sérénade*, which is derived from the Italian and Spanish *serenata*, a term formed from the Latin *serenus*, clear, serene. A serenade is properly music performed in the open air on a serene night, but is generally restricted to a musical performance given at night by a lover to his mistress under her window. The giving of serenades is little practised except by the Spanish and Italians, who generally on these occasions use the guitar as an accompaniment to their songs.

SERE'NUS, AULUS SEPTIMIUS, a Roman poet. Some of the antients call him merely Serenus, and others merely Septimius; and from this circumstance it has been inferred by some modern scholars that these two names belong to two individuals (Wernsdorf, *Poet. Lat. Min.*, ii., p. 247, &c.); but Marius Victorinus, Terentianus Maurus, and Sidonius Apollinaris frequently call him by his two names, Septimius Serenus, and therefore decide the question. He was a contemporary of Terentianus Maurus and of Martial (*Epigr.*, i. 87), and must consequently have lived in or shortly after the reign of Vespasian. Of the circumstances of his life nothing is known with certainty. Some modern scholars have supposed that the fifth poem in the fourth book of the *Sylvae* of Statius is addressed to Septimius Serenus, as all that is mentioned of the person addressed in that poem appears to be just what might be expected in a poet like Serenus. But the MS. reading in Statius is not Serenus, but Severus; and consequently the whole biography of Serenus, which has been made up out of that poem, is uncertain in the highest degree. The only thing we know of him is, that he was an extreme admirer of country life; for it is the country with all its charms that forms the subject of his poems, which he published under the title of 'Opuscula Ruralia.' Of these poems only a few fragments have been preserved by the antient grammarians. They are however sufficient to show that Serenus was a lyric poet of very great talents. The poem called 'Moretum,' which has frequently been printed together with the works of Virgil, is ascribed by Wernsdorf to Serenus; and 'Copa,' another work of the same kind, has likewise been attributed to Serenus by some modern scholars. Terentianus Maurus (*De Metris*, p. 2423, Putsch.) mentions another poem of Serenus, which is called 'Falisca,' and which probably contained a description of the country life in the district of the Faliscans. In this poem he used a peculiar kind of verse, consisting of three dactyls and one pyrrhic; and this metre is by Terentianus called ***metrum Faliscum***, and the poet himself Faliscus.

Compare the Essay of Wernsdorf on Serenus, in his '*Poet. Lat. Minores*,' ii., p. 247, &c.; and the collection of fragments, including the 'Moretum' and the 'Copa,' in the same vol., p. 264-298.

SERENUS SAMO'NICUS (QUINTUS), sometimes called Sammonicus Serenus, the name of two persons, father and son, who lived in the third century of the Christian æra. The father wrote a number of works in verse, which Gota and Alexander Severus read with pleasure (Spartian., *Vit. Ant. Get.*, p. 136, ed. Paris, 4to., 1603; Lamprid., *Vita Sever.*, p. 186); but he was put to death by order of Caracalla. (Spartian., *Vit. Caracall.*, p. 128. Compare Casaub., in *Script. Hist. Aug.*, p. 290, 428.) The son was tutor to the younger Gordian, to whom he left in legacy his father's rich library, consisting of sixty-two thousand volumes. (Jul. Capitolin., *Vit. Gordian. II.*, p. 235.) We have no means of deciding which of the two is the author of the Latin poem that we possess under this name, entitled 'De Medicina Præcepta Saluberrima;' for while the more antient writers ascribe it to the father, the more modern (*e.g.* Morgagni and Ackermann) consider it to be the work of the son. It consists of eleven hundred and fifteen hexameter lines, divided into sixty-five chapters, which treat of various diseases, with their remedies. Now and then, but very rarely (says Sprengel), does Serenus show that he had reflected on the nature and more remote causes of diseases, as for example when he attributes dropsy to obstructions of the spleen and liver (cap. 27, v. 498). He sometimes gives sound advice upon the treatment of diseases, and even gives his opinion against the incantations employed in the cure of fevers (cap. 51, v. 938). Notwithstanding this, he everywhere shows himself a zealous defender of the prejudices of his time; he affects a particular veneration for the numbers three, seven, and nine, and recommends the use of magical characters. For the cure of the species of intermittent fever called *ἡμιτριταῖος*, or double tertian, he recommends the use of the famous *Abracadabra*, of which he gives the following description (cap. 52, v. 944, et seq.):—

> 'Inscribis chartæ, quod dicitur Abracadabra,
> Sæpius: et subter repetis, sed detrahe summam,
> Et magis atque magis desint elementa figuris
> Singula, quæ semper rapies, et cetera figes,
> Donec in angustum redigatur litera conum.
> His lino nexis collum redimire memento.'

thus forming an equilateral triangle in this manner:—

A B R A C A D A B R A
A B R A C A D A B R
A B R A C A D A B
A B R A C A D A
A B R A C A D
A B R A C A
A B R A C
A B R A
A B R
A B
A

For further information respecting this magical word, see Du Cange, *Glossar. Med. et Inf. Latin.*, ed. Paris, 1840; Hofmann, *Lex. Univ.*; Sprengel, *Hist. de la Med.*, tom. ii., p. 147; C. Steph., *Dict. Hist.*, &c., p. 8, edit. N. Lloyd; Ger. Jo. Voss., *Op.*, t. 5, p. 24.

The first edition of the Poem of Serenus, according to Choulant (*Handbuch, &c.*), was printed *sine loco et anno*, in 4to., or large 8vo., at Milan, in black letter, before the year 1484. This edition is very scarce, and is said by Panzer (*Annal. Typogr.*, vol. ii., p. 555) to have been printed at Rome. The next edition (containing also Rhemnius Fannius, 'De Ponderibus et Mensuris') is that of Leipzig, 1515, 4to.; the two best are that by Keuchenius, Amstel., 1662, 8vo. (reprinted 1706, 8vo.); and that by Ackermann, Lips., 1786, 8vo. The poem has also been frequently printed with Celsus, and is contained in several collections of medical works, *e.g.* the *Aldine*, Venet., 1547, fol.; that of H. Stephens, Paris, 1567, fol.; and that of Rivinus, Lips., 1754, 8vo.: it is also inserted with copious notes in P. Burmann's 'Poëtæ Latini Minores,' Leid., 1731, 4to. Much historical and critical information is to be found in 'J. Bapt. Morgagni Epistolæ in Serenum Samonicum,' Patav., 1721, 8vo., which are reprinted in several editions of Celsus, and also in 'Morgagni Opuscula Miscellanea,' Venet., 1763, fol. See also C. G. Gruner, 'Variæ Lectiones in Q. Serenum Samonicum, e Codice Vratislaviensi decerptæ,' Jenæ, 1782, 4to., pp. 32; and C. G. Gruner, 'Var. Lect. in Q. Ser. Sam., ex Nicol. Marescalci Enchiridio excerptæ,' Jenæ, 1803, 4to.

SERGELL, JOHANN TOBIAS, a Swedish artist, entitled to a high rank among the sculptors of the last and present century, was born at Stockholm, September 8, 1740. He was originally apprenticed as a stonemason, and was employed among the workmen at the time the royal palace was building, when his diligence and intelligence attracted the notice of L'Archévêque, a French sculptor, who took him to Paris as his pupil in 1756. While in that capital, he assisted his master in modelling the statues of Gustavus Vasa and Gustavus Adolphus; and in 1767 he obtained a travelling pension, and visited Rome, where he continued for about ten years. On L'Archévêque's death in 1778, Gustavus III. bestowed on him the appointment and pension which had been enjoyed by that artist, and afterwards took him with him in his journey to Italy in 1784. One of his earliest works of note was his statue of Othryades, which obtained his reception into the Académie des Beaux Arts at Paris, a masterly performance, now in the royal museum at Stockholm. Among his other single statues, the most celebrated are—Diomedes carrying off the Palladium (now in possession of the earl of Shrewsbury); a Venus Callipyga (in the palace at Stockholm); Ceres with a torch in her hand seeking Proserpine; a Nymph rising from a bath; and a Faun, which last is esteemed his chef-d'œuvre in his works of this class, so masterly is the expression he has thrown into this figure. His principal groups are—Psyche bending over Cupid with her lamp; Oxenstjerna dictating the exploits of Gustavus Adolphus to the Muse of History; and Mars and Venus. Among his works in bronze are a colossal statue of Gustavus III., eleven feet high; and the monument to Des Cartes, executed at the command of that monarch for the Adolph-Frederik's church at Stockholm. The same church also contains what is universally allowed to be not only Sergell's master-piece, but one of the most sublime and admirable productions of modern sculpture, namely, the large bas-relief over the altar representing the Resurrection. The figure of Christ rising from the tomb is beyond all praise—it is superhuman and truly celestial. The sole drawback on the spectator's admiration at contemplating it is that so exquisite a performance should be only modelled, instead of being executed in marble. Among a variety of other works, including several busts of distinguished persons, the poets Bellman and Kellgren, &c., may be mentioned the mausoleum to Linnæus in the cathedral of Upsala.

After suffering from severe attacks of the gout, and also from continued lowness of spirits and despondency, Sergell died at Stockholm, February 26th, 1814. He was never married, consequently left no offspring, at least not legitimate; although Madame d'Ehrenstrom speaks of his son 'M. Gustave de Sergell;' but he left a successor to his talents and his fame in his pupil Bystrom, one of the most eminent sculptors now living.

SE'RGIUS I., a Syrian by birth, succeeded Conon in the see of Rome, A.D. 687. Two candidates for the see, a priest called Theodore and also the archdeacon Paschal, each of whom had numerous partisans, were on the point of coming to blows, when the principal citizens and officers of the garrison, in order to avoid a tumult, proposed to elect Sergius, who had acquired a reputation for piety and learning. The proposal being adopted by many of the clergy, Sergius, escorted by a numerous retinue, was taken to the Lateran church, the doors of which were broken open, and those of the opposite or Theodore's faction, who had fortified themselves in it, being driven out, Sergius was chaired, and Theodore was one of the first to salute him as pontiff. Paschal did the same afterwards, being forced to it by the multitude. Before Conon's death, Paschal had promised a sum of money to the Exarch of Ravenna, who, as the representative of the Byzantine emperor in Italy, had the right of giving or withholding his sanction to the election, and the money had been given for the purpose of securing his consent. The Exarch John came to Rome, and finding that Sergius had been elected by the majority, requested him to pay him what Paschal had promised, and upon Sergius demurring, the Exarch took several valuables from the church of St. Peter. Paschal was accused of sorcery, tried, and sentenced to be degraded and confined in a monastery, where he died. One of the first transactions of Sergius was to baptize Cedwalla, king of the West Saxons, who had come to Rome for that purpose. He also contributed to the diffusion of Christianity in Saxony and other countries by means of missionaries. In 791 the emperor Justinian II. assembled a general council at Constantinople, which being held in a hall of the palace which was surmounted by a dome, 'trulleum,' has been styled 'Concilium in Trullo.' It has also been called Quini-sextum, as being supplementary to the fifth and sixth œcumenic councils, which had published no canons of discipline or religious ceremonies. The council 'in trullo' was purposely assembled to supply this deficiency; one hundred and fifty bishops were present at it, and it passed more than one hundred canons on matters of discipline and ceremonies, six of which being in opposition to the practice of the Western or Roman church, the council was not approved of by Sergius, although his legate who attended the council had concurred in it. One of these canons enacted that married candidates for the priesthood might retain their wives after their ordination. There were also some points of dogma concerning the two natures of Christ and the Virgin Mary, in which the council and the pope did not agree. Justinian, irritated at the opposition of Sergius, sent Zacharias, his protospatarius, or general-in-chief, to Rome with orders to arrest Sergius and bring him prisoner to Constantinople. But the garrison of the Exarch at Rome took the pope's part, and Zacharias was obliged to take refuge in the pope's apartments, from whence he was sent back safely to Greece. A revolution, headed by Leontius, one of his generals, took place at Constantinople soon after, when Justinian was seized, mutilated, and banished to the Crimea, A.D. 695. Leontius did not long enjoy the fruits of his crime, for he was seized himself, and mutilated by Tiberius Apsimerus, who became emperor, and allowed the church of Rome and the pope to remain undisturbed. Sergius occupied himself in restoring the church of St. Peter, which had been greatly dilapidated. He died A.D. 701, and was succeeded by John VI.

SERGIUS II., a native of Rome, was elected to succeed Gregory IV., A.D. 844, and was consecrated without waiting for the approbation of the emperor Lotharius, who sent his son and colleague Louis into Italy with an army. Louis came to Rome, where he was received by the pope and clergy in a friendly manner, and was crowned king of Italy. The soldiers of Louis however committed great devastation in the surrounding country and in the suburbs of the city, but the pope at last induced Louis to withdraw his troops to the north. Soon after the Saracens from Africa came up the Tiber and ravaged the country, plundering the churches of St. Peter and St. Paul, which were outside of the walls, but they could not enter Rome. They then proceeded by the Via Appia to Fondi, which they sacked. Sergius died A.D. 847.

SERGIUS III. was elected A.D. 904, by the Tuscan party, as it was called, because it was headed by Adelbert, marquis of Tuscany, and of which two Roman ladies of licentious character, Marozia and her mother Theodora, were the most influential leaders. They had deposed and imprisoned Christopher, who had imprisoned the preceding pope Leo V., and had forced him to resign his see to him. Sergius had had a son by Marozia, who was afterwards pope by the name of John X. Sergius seems to have been a man of some abilities; his character has been variously represented by different writers. The history of Italy, and especially of Rome, during the tenth century, is extremely obscure, though it is evident by all concurrent testimonies that it was a most profligate age. Sergius died in 913, and was succeeded by Anastasius IV.

SERGIUS IV., a native of Rome, succeeded John XVIII. in 1009. He encouraged the princes of Italy to unite in order to drive away the Saracens, who had occupied several parts of the peninsula. It was in his time that the Normans began to muster in South Italy. Sergius died in 1012, and was succeeded by Benedict VIII.

SERIA'NA, an entirely tropical South American and West Indian genus of the natural family Sapindaceæ, named by Schumacher after Serjeant, a French friar and botanist, but the genus is also and more commonly written Serjania. It is characterised by having four to five sepals. Petals four, each furnished with a scale above the base, those of the lower petals ending in an inflexed appendage. Glands 2 to 4, on the disc. Stamens 8; style trifid; capsule 3-winged, or composed of 3 carpels adnate to the filiform axis. Carpels 1-celled, 1-seeded. The species consist of climbing or twining shrubs with tendrils, and the flowers white, arranged in racemes. Some of them are remarkable for the possession of very poisonous properties. S. triternata is acrid and narcotic, and employed for the purpose of stupifying fish.

SERIES. The mathematical meaning of the word series is, a set of terms, finite or infinite in number, connected together by addition or subtraction, and formed upon some distinct law. If it had been the plan of this work to write treatises on the various branches of pure mathematics, the present article would have been brief, and abounding in references to the articles on algebra and the differential calculus, the most important results of which are expressed in Series; but in a work which, without entering into such full detail, professes to furnish references to the most important detached doctrines of the exact sciences, the present article must extend to some length.

Series may be either finite or infinite in the number of their terms. As to finite series, such for instance as 'x terms of 1 + 2 + 3 + ...,' the only question of importance which generally arises with respect to them is, how to express the sum as a function of the indefinite number of terms, x. On this point we refer to the articles INTEGRATION, FINITE, and SUMMATION: it is with the doctrine of infinite series that the mathematician is more particularly concerned in the present article. Again, as to the manner in which the differential calculus is applied to the development of functions in series, we refer to TAYLOR'S THEOREM.

A series of an infinite number of terms may be either purely numerical, as 1 + 2 + 3 + 4 + ..., in which the symbol + . . ., or +, &c., means that the series is to be carried on for ever, the law of formation of the written terms being continued through all the unwritten ones: or it may contain literal expressions with an obvious law of formation, as in $1 + 2x + 3x^2 + \ldots.$ A series of the latter class is reduced to one of the former as soon as any definite value is given to the letters it contains.

An infinite series may be either convergent or divergent, as explained in the article CONVERGENT. The various tests there explained will perhaps serve to settle this point as to the greater number of series actually employed; but the following (' Diff. Calc.,' *Lib. of Useful Knowl.*, pp. 236, 326; we shall refer to this work in the sequel under the letters D. C.) will leave no doubtful case, though its application may sometimes be troublesome.

Let ψx be the xth term of a series $\psi 1 + \psi 2 + \psi 3 + \ldots.$ (thus a^{x-1} is the xth term of $1 + a + a^2 + \ldots.$; xa^{x-1} of $1 + 2a + 3a^2 + \ldots.$), and let $P_0 = -x\psi' x : \psi x$, $\psi' x$ being the differential coefficient of ψx. Let a_0 be the limit of P_0 when x increases without limit; then if a_0 be greater than 1, the series is convergent; if a_0 be less than 1 (negative quantity included), divergent; if = 1, doubtful.

In the doubtful case of the preceding, let $P_1 = \log x (P_0 - 1)$, and let a_1 be its limit when x increases without limit. Then if a_1 be >1, the series is convergent; if <1, divergent; if = 1, doubtful. In this doubtful case examine $P_2 = \log \log x (P_1 - 1)$, if which let the limit be a_2. Then if $a_2 > 1$, the series is convergent; if <1, divergent; if = 1, doubtful; and so on. In brief, take the set of quantities

$$P_0 = -x\frac{\psi' x}{\psi x},\ P_1 = \log x(P_0 - 1),\ P_2 = \log\log x(P_1 - 1)$$
$$P_3 = \log\log\log x\,(P_2 - 1),\ \&c.\ \&c.;$$

make x infinite; then, according as the first of these which differs from unity is greater than or less than unity, the series is convergent or divergent. If it be more convenient to write $1 : \phi x$, instead of ψx for the xth term of the series, then P_0 must be $x\phi' x : \phi x$, instead of $-x\psi' x : \psi x$. Nor need ψx be the xth term; it may stand for the $(x + n)$th term, n being constant. For example, let the series be $(\log 1)^a 1^{-b} + (\log 2)^a 2^{-b} + (\log 3)^a 3^{-b} + \ldots.$: we have here

$$\psi x = \frac{(\log x)^a}{x^b},\ -x\frac{\psi' x}{\psi x} = b - \frac{a}{\log x} = P_0.$$

When x is infinite, $P_0 = b$; so that the series is convergent when $b > 1$, and divergent when $b < 1$, but doubtful when $b = 1$. In this last case P_1 is easily seen to be $-a$; whence the series is convergent if a be negative, and numerically >1; and divergent when numerically <1. But when $a = -1$, we have $P_2 = \log\log x \times 0 = 0$ in all cases; and 0 being < 1, the series is then divergent. Thus the first three of the following series are convergent, and all the rest divergent.

$$S\frac{(\log x)^{10}}{\sqrt{x^3}},\ S\frac{(\log x)^{100}}{\sqrt[100]{x^{101}}},\ S\frac{(\log x)}{\sqrt[6]{x^7}},\ S\frac{1}{x(\log x)},$$
$$S\frac{1}{\sqrt{x}.(\log x)^{1000}},\ S\frac{1}{\sqrt[6]{x^5}.(\log x)^{1000}},\ S\frac{1}{x(\log x)^{\frac{1}{2}}}.$$

By the symbol $S\phi x$ is meant the series $\phi x + \phi(x+1) + \phi(x+2) + \ldots$; but when a number is written beneath S, as in S_2, it indicates the value of x in the first term of the series. Thus $S_4 x$ stands for $4+5+6+\ldots.$, $S_a \log x$ stands for $\log a + \log(a+1) + \ldots.$ Some such abbreviation is most wanted in an article of reference, in which compression is desirable; but the student should write his series at more length until he is well accustomed to them. An examination of the preceding series will make it appear singular that the first three should be convergent, and the last three divergent; but so it is, beyond all question.

A divergent series is, arithmetically speaking, infinite; that is, the quantity acquired by summing its terms may be made greater than any quantity agreed on at the beginning of the process. Such is evidently the case with $1+2+4+\ldots.$, or $S_0 2^x$. Nevertheless, as every algebraist knows, such series are frequently used as the *representatives of finite quantities*. It was usual to admit such series without hesitation; but of late years many of the continental mathematicians have declared against divergent series altogether, and have asserted instances in which the use of them leads to false results. Those of a contrary opinion have replied to the instances, and have argued from general principles in favour of retaining divergent series. Our own opinion is, that the instances have arisen from a misunderstanding or misuse of the series employed, though sufficient to show that divergent series should be very carefully handled; but that, on the other hand, no perfectly general and indisputable right to the use of these series has been established *à priori*. They always lead to true results when properly used, but no demonstration has been given that they must always do so.

Before however we proceed to reason upon them, we must distinctly understand what we mean by an *infinite* series. Some persons cannot imagine an infinite series, except by means of successions of finite terms: thus they have no other idea of $1+2+4+8+\ldots$, except as something of which the conception is a pure result of the successive consideration of 1, $1+2$, $1+2+4$, $1+2+4+8$, &c. If they can get no further than this, that is, if at no stage of their contemplation can they treat $1+2+4+\ldots$ as anything more than carried to some enormous number of terms, with a right to carry it further; we can then concede to them the right to object, in the manner described, to the use of a divergent series, though we think it possible that even in this case an answer might be given to the objection. But if there be any who can with us carry their notions further, and treat the series as *absolutely endless*, in the same manner as we are obliged to conceive time and space to be absolutely endless, looking upon the result not as to its arithmetical value, but as to its algebraical form and capability of being the object of algebraical operations—we then think that we have those with whom the question of divergent series can be argued on something like a basis of demonstration. They may arrive at the final idea by means of the successions which the first class of thinkers say *must end somewhere*; but they answer, that this is no more true than that space must end somewhere: if it be granted that we are capable of conceiving a straight line extended without limit, with equal parts set off throughout its total infinite length, it must equally be granted that we might suppose one term of a series written at each and every point of subdivision. To this issue the question might be brought, namely, the alternative of allowing the conception of the infinite series, or of denying that of the infinite straight line. And it must be remarked that the considerations by which we limited the use of the word INFINITE in that article do not apply here, for we are not reasoning upon any supposed[*] attainment of the other end of the straight line, but upon ideas derived from a process of successions carried on during such attempt as we can make in our thoughts towards that attainment.

This being premised, let us now consider the series $1+a+a^2+a^3+\ldots$ *ad infinitum*, the last words being used strictly in the above sense, without reference to any particular value of a, and only as an object of algebraical operation. To what finite function of a is this an algebraical equivalent in all matters of operation? Let us consider first merely results of operation, without any question as to whether the series operated on have values or not, or whether expressions which appear to be the same as far as operations are concerned, are to be the same in value or not, when any difficulty arises as the value of either. We assume those five rules of operation and their consequences, on which [OPERATION] the technical part of algebra is founded. If we then call the preceding series P, we find that P and $1 + aP$ are the same series. If then $P = 1 + aP$, we find $P = 1 : (1-a)$, a result which is certainly not true in any arithmetical point of view, when $a > 1$; for in such a case the series is infinite, and the finite expression negative. Leaving this, let us assume, for trial, if the reader pleases, the equation $1 : (1-a) = S_0 a^x$; in this change a into $1 : a$, and add, which gives

$$\frac{1}{1-a} + \frac{a}{a-1} = 1 + S_1 a^x + 1 + S_1 a^{-x}$$

or $1 + S_1(a^x + a^{-x}) = 0$, a result which is again perfectly incongruous in an arithmetical point of view. At full length it is

$$1 + a + \frac{1}{a} + a^2 + \frac{1}{a^2} + \ldots. = 0$$

To test this curious result, by operations merely, call it

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[*] Indeed it is only a phraseological attainment of infinite magnitude which is used in the article cited: when we *say* that $a = b$ if x be infinite, we mean that a and b never cease to approach each other as long as the value of x increases.

ϕa, and multiply $A + Ba + Ca^2 + \ldots$ by it: the result, by common rules, will be found to be

$$(A + B + C + \ldots\ldots)\,\phi a = (A + Ba + \ldots)\,\phi a;$$

a result which agrees perfectly with $\phi a = 0$, and with no other supposition whatsoever.

A great many other instances might be given, in which the use of $\phi a = 0$ makes sense, so to speak, of results in the formation of which ϕa has been used. And it is generally admitted that divergent series are found to make sense, in the same manner, of almost every result in the formation of which they are used; and also that when such results happen themselves to be free of divergency, there is very rarely any distinction, as to either truth or clearness, between them and the results of ordinary algebra; insomuch that the objection of those who would avoid them altogether, as usually stated, amounts, so far as operations are concerned, to the assertion that they *sometimes* give false results.

If we then compare the position in which we stand with respect to divergent series, with that in which we stood a few years ago with respect to impossible quantities, we shall find a perfect similarity. The divergent series, that is, the equality between it and a finite expression, is perfectly incomprehensible in an arithmetical point of view; and so was the impossible quantity. The use of divergent series has been admitted, by one on one explanation, and by another on another, almost ever since the commencement of modern algebra; and so it was with the impossible quantity. It became notorious that such use generally led to true results, with now and then an apparent exception, which most frequently ceased to be such on further consideration; this is well known to have happened with impossible quantities. In both cases these apparent exceptions led some to deny the validity of the method which gave rise to them, while all were obliged to place them both among those parts of mathematics (once more extensive than now) in which the power of producing results had outrun that of interpreting them. But at last came the complete explanation of the impossible quantity [NEGATIVE AND IMPOSSIBLE QUANTITIES], showing that all the difficulty had arisen from too great limitation of definitions; and almost about the same time arose that disposition among the continental writers, of which we have spoken above, namely, to wait no longer for the explanation of the true meaning of a divergent series, but to abandon it altogether. But why should the divergent series, of all the results of algebra which demand interpretation, be the only one to be thrown away without further inquiry, when in every other case patience and research have brought light out of darkness?

As far as the matter has yet gone, very little has been done towards the interpretation of a divergent series independently of its invelopment, or function from which it is developed. When this invelopment is known, and the series deduced from it, there are means of stopping the divergency, by arresting the development at any given point, and turning the remainder not into a further development, but into a finite form. Thus if ϕx, a given function of x, should give a divergent series $A_0 + A_1x + \ldots\ldots$, all that part of the development which follows $A_n x^n$ may be included in

$$\int_0^x \phi^{(n+1)}(x-v)\,v^n dv \quad : \quad 1.2.3\ldots\ldots n.$$

This will be proved in TAYLOR'S THEOREM, and it is a result of great importance, because it gives the means of removing all the doubtful points of divergent series from the ordinary branches of mathematics.

Next to the question of convergency or divergency, comes that of continuity or discontinuity. We are not here speaking of continuity of value, but of form. A series is continuous when for all values of x it represents the same function of x. Thus $S_0 x^n$ or $x^0 + x^1 + x^2 + \ldots$, is in all cases the development of $(1-x)^{-1}$, whether it be convergent or divergent. Those even who reject divergent series altogether, though they would call this series, when $x > 1$, a false or inadmissible development of $(1-x)^{-1}$, would not, though they reject it, look upon it as possible to arise from any other function. But the series

$$S_1(-1)^{n+1}\frac{\sin.\ n\theta}{n} \text{ or } \sin.\ \theta - \frac{\sin.\ 2\theta}{2} + \frac{\sin.\ 3\theta}{3} - \ldots$$

is discontinuous; for certain values of θ it represents one function, and for other values another. When θ is any multiple of π [ANGLE] it is $=0$; when θ falls between $-\pi$ and $+\pi$, it is $\frac{1}{2}\theta$; when θ falls between π and 3π, it is $\frac{1}{2}\theta - \pi$, &c.; in fact, it stands for $\frac{1}{2}\theta - m\pi$, where m is to be so taken that $\frac{1}{2}\theta - m\pi$ shall fall between $-\frac{1}{2}\pi$ and $+\frac{1}{2}\pi$. Again, the series

$$S_0\frac{a^n x}{(1+a^n x)(1+a^{n+1}x)} = \frac{1}{(a-1)(x+1)} \text{ or } \frac{x}{(1-a)(x+1)}$$

according as $a > 1$ or < 1: and when $a = 1$, it is infinite. Remember that by calling a series infinite we do not merely mean that it is divergent, for a divergent series may be the development of a finite quantity; thus $1+2+4+\ldots\ldots$ is a development of -1 from the form $(1-2)^{-1}$. But we mean that the *arithmetical value* of the function developed is infinite when we say that the series is infinite.

Discontinuity of form may be in many cases avoided by an extension of the modes of algebraical expression. Thus if we write down the expression

$$\frac{1}{a-1}\left\{\frac{1}{x+1} - \frac{1}{a^k x+1}\right\}$$

and consider k as having a very great value, the second term will be very small or very near to unity, according as a is >1 or <1. If we introduce the symbol a^∞ as representing ∞ when $a > 1$, and 0 when $a < 1$, we have, on putting ∞ for k, the representation of both forms of the preceding series in one. We shall now proceed to point out some of the principal modes of transforming series into others, or deducing others from them, so far as this is done without interfering with the developments in Taylor's THEOREM.

1. If ϕx can be developed into $a + a_1x + a_2x^2 + \ldots$, then $ab + a_1b_1x + a_2b_2x^2 + \ldots$ can be developed as follows (D. C., p. 239). Let the last be ψx, and from b, b_1, b_2, &c. [DIFFERENCE] form Δb, $\Delta^2 b$, &c.; then

$$\psi x = b\phi x + \Delta b.x\phi' x + \frac{\Delta^2 b}{2}x^2\phi'' x + \frac{\Delta^3 b}{2.3}x^3\phi''' x + \ldots$$

where $\phi' x$, $\phi'' x$, &c. are the successive differential coefficients of ϕx. If b, b_1, &c. be values of a rational and integral function of n, denoted by b_n, the preceding is not an infinite series, but a finite expression. We have not room for examples, and it is to be remembered that this is an article of reference. Particular classes of instances are

$$b + b_1x + \ldots = \frac{b}{(1-x)} + \frac{\Delta b.x}{(1-x)^2} + \frac{\Delta^2 b.x^2}{(1-x)^3} + \ldots$$

$$b + nb_1x + n\frac{n-1}{2}b_2x^2 + n\frac{n-1}{2}\frac{n-2}{3}b_3x^3 + \ldots =$$

$$(1+x)^n\left\{b + n\Delta b\frac{x}{1+x} + n\frac{n-1}{2}\Delta^2 b\left(\frac{x}{1+x}\right)^2 + \ldots\right\}$$

$$b + b_1x + b_2\frac{x^2}{2} + b_3\frac{x^3}{2.3} + \ldots = \epsilon^x\left(b + \Delta b.x + \Delta^2 b\frac{x^2}{2} + \ldots\right)$$

the preceding is a case of a more general theorem (D. C., p. 565) from which the following may also be deduced:—

$$b + b_1x + \ldots = \frac{b}{1+mx} + \frac{\nabla b.x}{(1+mx)^2} + \frac{\nabla^2 b.x^2}{(1+mx)^3} + \ldots$$

$\nabla b = b_1 + mb$, $\nabla^2 b = b_2 + 2mb_1 + m^2 b$, &c. By this theorem many divergent series may be converted into convergent ones, or the convergency of convergent series may be increased.

2. Let $r = \surd(1 - 2\cos\theta.x + x^2)$, $\tan\phi = \frac{x\sin\theta}{1 - x\cos\theta}$.

Then $b + b_1\cos\theta.x + b_2\cos 2\theta.x^2 + b_3\cos 3\theta.x^3 + \ldots =$

$$\cos\phi\frac{b}{r} + \cos(\theta + 2\phi)\frac{\Delta b\,x}{r^2} + \cos(2\theta + 3\phi)\frac{\Delta^2 b.x^2}{r^3} + \ldots$$

and $b_1\sin\theta.x + b_2\sin 2\theta.x^2 + b_3\sin 3\theta\,x^3 + \ldots =$

$$\sin\phi\frac{b}{r} + \sin(\theta + 2\phi)\frac{\Delta b\,x}{r^2} + \sin(2\theta + 3\phi)\frac{\Delta^2 b\,x^2}{r^3} + \ldots$$

3. Let ϕx be a rational and integral function of x; then

$$\phi x + \phi(x+1).a + \phi(x+2).a^2 + \ldots = \frac{1}{1-a}\phi x +$$

$$\frac{a}{(1-a)^2}\phi' x + \frac{a+a^2}{(1-a)^3}\frac{\phi'' x}{2} + \frac{A_3}{(1-a)^4}\frac{\phi''' x}{2.3} + \ldots.$$

$$A_3 = a + 4a^2 + a^3,\ A_4 = a + 11a^2 + 11a^3 + a^4$$

$$A_5 = a + 26a^2 + 66a^3 + 26a^4 + a^5, \text{ \&c.}$$

$$A_6 = a + 57a^2 + 302(a^3 + a^4) + 57a^5 + a^6.$$

This must lead to a finite expression for the series, and is frequently the shortest way of obtaining it.

4. Let $z=\epsilon^{\theta\sqrt{-1}}=\cos\theta+\sqrt{-1}\,.\sin\theta$

and $\phi x=a+a_1x-a_2x^2+\ldots\ldots$

$$\frac{1}{2}\left\{\phi(zx)+\phi\left(\frac{x}{z}\right)\right\}=a_0+a_1\cos\theta\,.\,x+\ldots\ldots$$

$$\frac{1}{2\sqrt{-1}}\left\{\phi(zx)-\phi\left(\frac{x}{z}\right)\right\}=a_1\sin\theta\,.\,x+\ldots\ldots$$

the series resembling those in (2). Further varieties will appear in TAYLOR'S THEOREM.

5. If $\phi(0)+\phi(1).x+\phi(2).x^2+\ldots$ be the development of a perfectly continuous function of x, and if ϕn be a function which never becomes infinite for any real value of n, positive or negative; then the same function may be also developed into $-\phi(-1).x^{-1}-\phi(-2).x^{-2}-\phi(-3).x^{-3}-\ldots$ (D. C., p. 560).

6. If $\phi x=a_0+a_1x+a_2x^2+\ldots\ldots$ and if $\rho_1, \rho_2 \ldots \rho_n$ be the *n nth* ROOTS of unity, then (D. C., p. 319)

$$a_0+a_nx^n+a_{2n}x^{2n}+\ldots=\frac{\phi(\rho_1x)+\ldots+\phi(\rho_nx)}{n}$$

$$a_1x+a_{n+1}x^{n+1}+\ldots=\frac{\rho_1^{n-1}\phi(\rho_1x)+\ldots+\rho_n^{n-1}\phi(\rho_nx)}{n}$$

$$a_2x^2+a_{n+2}x^{n+2}+\ldots=\frac{\rho_1^{n-2}\phi(\rho_1x)+\ldots+\rho_n^{n-2}\phi(\rho_nx)}{n}$$

and so on. Also if we make ρ_1, ρ_2, &c. the nth roots of -1, and use the same results, only altering the multipliers, into ρ_1^{2n-1}, &c., ρ_1^{2n-2}, &c., we have the sums of the same series with the terms alternately positive and negative.

7. One of the simplest modes of actually finding a finite expression for a series, finite or infinite, the coefficients of which are values of a rational and integral function, is the continual multiplication by $1-x$, which must at last produce a finite expression. It must be remembered that multiplication by $1-x$ may be performed by letting the first coefficient remain, and diminishing every other coefficient by its predecessor. Thus $a+bx+cx^2+ex^3+\ldots\ldots$ multiplied by $1-x$ gives $a+(b-a)x+(c-a)x^2+(e-a)x^3+$. And a finite series must be supposed to be continued *ad infinitum* with vanishing coefficients. For example, it is required to find a finite expression for $1^3+2^3x+3^3x^2+\ldots\ldots$; write this as in the first line, and make successive multiplications by $1-x$, as in the following lines:—

$$\begin{array}{l}
1+8x+27x^2+64x^3+125x^4+\ldots\\
1+7x+19x^2+37x^3+\ \ 61x^4+\ldots\\
1+6x+12x^2+18x^3+\ \ 24x^4+\ldots\ldots\\
1+5x+\ \ 6x^2+\ \ 6x^3+\ \ \ 6x^4+\ldots\ldots\\
1+4x+\ \ \ x^2+\ \ 0x^3+\ \ \ 0x^4+\ldots\ldots
\end{array}$$

After four multiplications, then, by $1-x$, the series becomes $1+4x+x^2$; whence its value is—

$$\frac{1+4x+x^2}{(1-x)^4}$$

The rule for doing this is to take the successive differences of the coefficients, as in the article DIFFERENCE, with this addition, that the first term of every line is to be carried on, and made the head of the next line. Thus to find $(n+1)^3x^n+(n+2)^3x^{n+1}+\ldots\ldots$ we must proceed as follows:—

$$\begin{array}{l|r|r|}
(n+1)^3 & n^3+3n^2+\ 3n+\ 1 & n^3+3n^2+3n+\ 1\\
(n+2)^3 & 3n^2+\ 9n+\ 7 & -n\ +6n+\ 6\\
(n+3)^3 & 3n^2+15n+19 & 6n+12\\
(n+4)^3 & 3n^2+21n+37 & 6n+18\\
(n+5)^3 & 3n^2+27n+61 & 6n+24
\end{array}$$

$$\begin{array}{r|l}
n^3+3n^2+3n+1 & n^3+3n^2+3n+1\\
-2n^3-3n^2+3n+5 & \ -3n^3-6n^2+4\\
n^3\qquad\qquad\quad +6 & +3n^3+3n^2-3n+1\\
6 & -\ n^3\\
6 & \quad 0
\end{array}$$

whence the numerator required is $(n^3+3n^2+3n+1)x^n-(3n^3+6n^2-4)x^{n+1}+(3n^3+3n^2-3n+1)x^{n+2}-n^3x^{n+3}$, and the denominator is $(1-x)^4$.

Independently of the modes of deriving series obtained from Taylor's Theorem, and of which we are to speak elsewhere, there are two modes of forming them which deserve attention. The first depends upon the numbers called the differences of nothing [NOTHING, DIFFERENCES OF]; the second on those called NUMBERS OF BERNOULLI.

By the first of these any function of ϵ^x can be expanded in powers of x.

$$f\epsilon^x=f1+f(1+\Delta)\,0\,.\,x+f(1+\Delta)0^2.\,\frac{x^2}{2}+\ldots$$

Here $f(1+\Delta)0^n$ is a symbol of the calculus of operations [OPERATION], which expanded is—

$$f1.0^n+f'1.\Delta0^n+\ldots\ldots+f^{(n)}1\,\frac{\Delta^n\,0^n}{2.3\ldots n}$$

it being unnecessary to go further, because $\Delta^m0^n=0$ whenever m is greater than n. (D. C., 307.)

The numbers of Bernoulli occur first in the development of $(\epsilon^x-1)^{-1}$, a series the importance of which can only be estimated by its use in SUMMATION. Taking the numbers from the article cited above, or making

$$B_1=\frac{1}{6}\ \ ,\ \ B_3=\frac{1}{30}\ \ ,\ \ B_5=\frac{1}{42}\ \ ,\ \ B_7=\frac{1}{30},\ \text{\&c.}$$

$$\frac{1}{\epsilon^x-1}=\frac{1}{x}-\frac{1}{2}+\frac{B_1x}{2}-\frac{B_3x^3}{[4]}+\frac{B_5x^5}{[6]}-\ldots\ldots$$

$$\frac{1}{\epsilon^x+1}=\frac{1}{2}-\frac{3B_1x}{2}+\frac{15B_3x^3}{[4]}-\frac{63B_5x^5}{[6]}+\ldots\ldots$$

where $[n]$ means $1.2.3\ldots\ldots n-1.n$.

We shall now give a number of series which are not of very frequent use, but which may sometimes be sought in a work of reference. Under the last predicament we can never suppose that any of the following developments would come: $(1+x)^n$, ϵ^x, a^x, $\log(1+x)$, $\log\frac{1+x}{1-x}$, $\sin x$, or $\cos x$. Some terms are given, and $\pm\ldots\ldots$ is omitted to save room.

$$\tan x=x+\frac{x^3}{3}+\frac{2x^5}{15}+\frac{17x^7}{315}+\frac{62x^9}{2835}+\frac{1382x^{11}}{155925}$$

$$\cot x=\frac{1}{x}-\frac{x}{3}-\frac{x^3}{45}-\frac{2x^5}{945}-\frac{x^7}{4725}-\frac{2x^9}{93555}$$

$$\sec x=1+\frac{x^2}{2}+\frac{5x^4}{24}+\frac{61x^6}{720}+\frac{277x^8}{8064}$$

$$\text{cosec}\ x=\frac{1}{x}+\frac{x}{6}+\frac{7x^3}{360}+\frac{31x^5}{15120}+\frac{127x^7}{604800}$$

$$\sin^{-1}x^*=x+\frac{1}{2}\frac{x^3}{3}+\frac{1.3}{2.4}\frac{x^5}{5}+\frac{1.3.5}{2.4.6}\frac{x^7}{7}$$

$$\tan^{-1}x^*=x-\frac{x^3}{3}+\frac{x^5}{5}-\frac{x^7}{7}$$

$$\log\frac{x}{\sin x}=\frac{x^2}{6}+\frac{x^4}{180}+\frac{x^6}{2835}+\frac{x^8}{37800}+\frac{x^{10}}{467775}$$

$$\log\frac{1}{\cos x}=\frac{x^2}{2}+\frac{x^4}{12}+\frac{x^6}{45}+\frac{17x^8}{2520}+\frac{31x^{10}}{14175}$$

$$\log\frac{\tan x}{x}=\frac{x^2}{3}+\frac{7x^4}{90}+\frac{62x^6}{2835}+\frac{x^8}{2700}+\frac{32x^{10}}{467775}$$

These logarithms are the Naperian logarithms, as is always the case in analysis, unless the contrary be expressed (as it is usual to say, but it really never happens):

$$\frac{1}{\log.(1+x)}=\frac{1}{x}+\frac{1}{2}-\frac{x}{12}+\frac{x^2}{24}-\frac{19x^3}{720}+\frac{3x^4}{160}-\frac{863x^5}{60480}.$$

We must again remind the reader that the symbol +, &c., or −, &c., is throughout omitted to save room.

There is one property of series which deserves particular notice (D. C., pp. 226 and 649) as creating a most remarkable distinction between those which have all their terms positive, and those which have them alternately positive and negative. The former, even if the terms diminish without limit, are not necessarily convergent; thus $1+2^{-1}+3^{-1}+\ldots$ is divergent. But if the terms be alternately positive and negative, and diminishing without limit, the series is always convergent, and the error made by stopping at any term is less than the first of the terms thrown away. And the remarkable part of the property is that this last is true, even if the series become divergent, by having its terms increasing without limit, instead of diminishing; so that if the terms diminish for a time, and then begin to increase, the portion of the series during which the diminution takes place may be made use of in approximating to its arithmetical value. That is, if A_1, A_2, &c. be all positive quantities, and if the infinite series $A_1 - A_2 + A_3 - \ldots$ be carried as far as A_n, the error is less than A_{n+1}, whatever the law of the terms may be, or however rapidly they may afterwards increase. Let us take, for instance,—

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* In these series the angle is less than a right angle, positive or negative.

$$1-\frac{2}{x}+\frac{2.3}{x^2}-\frac{2.3.4}{x^3}+\frac{2.3.4.5}{x^4}-\ldots.$$

Let x be ever so great, the rapid increase of the numerators must still make this series ultimately divergent. Nevertheless, if x be considerable, the first terms diminish so rapidly that, with the aid of the above theorem, a good approximation may be made to the arithmetical value of the function from which the series was derived. Let $x=100$, whence the series becomes—

$$1 - \cdot 02 + \cdot 0006 - \cdot 000024 + \cdot 00000120 - \ldots.$$

After the hundredth term the terms will begin to increase, and more and more rapidly; but the theorem enables us, when $x=100$, to make the following assertions; first, 1 is too great, but not by so much as ·02; 1 − ·02, or ·98, is too small, but not by so much as ·0006; ·98 + ·0006, or ·9806, is too great, but not by so much as ·000024; ·9806 − ·000024, or ·980576, is too small, but not by so much as ·00000120; ·980576 + ·00000120, or ·9805772, is too great, but not by so much as the next term; and so on. It were to be wished that a complete proof of this theorem could be given, which has not been done hitherto, though it has been shown to be true in all the most important classes of series.

SERINAGHUR, *Srinaghur*, a town of Hindustan, in the presidency of Bengal and province of Gurwal, of which it is the capital. It is about 140 miles north-east from Delhi, in 30° 13′ N. lat. and 78° 45′ E. long. It was formerly the residence of the raja of Gurwal, and was a place of considerable commercial importance, but it has much declined, the greater part of the merchants having abandoned it and established themselves at Almora. The air is unwholesome, and it is subject to frequent earthquakes, one of which destroyed the palace of the raja. The town consists of one long principal street, in which there is a bazaar, and a few other streets, which are narrow and dirty. In 1821 there were about 560 houses. The town stands on the left bank of the Alakananda, an affluent of the Ganges, and the river is crossed by a bridge of ropes 240 feet long. On the opposite side is a Hindu temple, which is frequented by a great number of pilgrims.

SERINGAPAṬAM (*Sri-Ranga-Patana*), a town and fortress of Hindustan, in the presidency of Madras and province of Mysore, is situated on a small but beautiful and fertile island in the river Cavery, in 12° 25′ N. lat. and 76° 44′ E. long. The fortress is at the western extremity of the island. The streets of the town are narrow, crooked, and dirty, but there are several palaces and a great number of pagodas and mosques. The palace formerly inhabited by the sovereigns of Mysore is very extensive, but it is now in a ruinous condition. It has large gardens, with garden-houses and pavilions, and a splendid mausoleum built by Hyder Ali, under which are interred the remains of Hyder and his son Tippoo Saib. The other chief public buildings are—the principal mosque, the Indian temple of Sri-Ranga, the arsenal, and the cannon-foundry; there is a handsome bridge over one of the branches of the Cavery. The fortress is occupied by a garrison of British troops.

In 1610 the raja of Bijanaghur obtained possession of Seringapatam, which for a long time before had been an important fortress, and made it the capital of Mysore. It was extended by his successors, and continual additions were made to the fortress. Under Hyder Ali and his son Tippoo Saib it became a place of great wealth and importance, and the inhabitants are said to have amounted to 150,000.

Tippoo Saib, in 1789, having seized upon the territory of the raja of Travancore, Great Britain, who was in alliance with the raja, and bound by treaty to assist him, declared war against Tippoo, who then abandoned Travancore, and retired to Seringapatam. The English concluded a treaty of alliance with the Nizam, June 1, 1790, and with the Mahrattas, July 7. Lord Cornwallis took Bangalore by assault, and advanced against Seringapatam. On the 5th of May, 1791, he obtained a victory which made him master of the approaches to the fortress, but the want of provisions and the delay of assistance promised by the Mahrattas compelled him to return to Bangalore. On the 5th of February, 1792, Lord Cornwallis, in conjunction with the Nizam and the Mahrattas, again arrived before Seringapatam, which was invested, and the siege pushed with vigour till February 12, 1792, when Tippoo, finding himself reduced to extremity, accepted the conditions imposed upon him, and by a treaty, signed March 18, 1792, relinquished one half of his territory, paid a very large sum as indemnity, and delivered up his two sons as hostages for the fulfilment of the treaty. The territories ceded were divided into three equal portions, one of which was given to the Nizam, one to the Mahrattas, and one to Great Britain. Tippoo, in 1798, desirous of regaining his territories, entered into a negociation with the governor of the Isle of France, from whom he received a body of troops, and also sent an embassy to request assistance from Shah Zemaun, king of Cabul. Great Britain, regarding these demonstrations as a declaration of hostilities, concluded another treaty with the Nizam, and war was again declared against Tippoo. On the 30th of April, 1799, Seringapatam was invested by the united armies of General Harris and General Stuart. On the 4th of May the fortress was carried by assault, Tippoo himself being slain while fighting with desperate valour, together with 8000 men. Tippoo Saib, who was exceedingly avaricious, had accumulated immense treasures in his palace, consisting of money, jewels, plate, rich stuffs, &c., all of which were taken possession of by the conquerors. His remains were interred with military honours in the mausoleum of his father. (*L'Art de vérifier les Dates.*)

After the death of Tippoo Saib, the city of Mysore was made the capital of the province of Mysore, instead of Seringapatam. In 1800 the population of Seringapatam had fallen to 20,000, and in 1820 to 10,000.

SERJEANT, or **SERGEANT**, is a non-commissioned officer in a troop of cavalry or in a company of infantry. The duties of serjeants are to drill or instruct in discipline the recruits of a regiment; and on parade they act as markers or guides in the performance of the evolutions. The serjeants of infantry are now armed with muskets like the rest of the troops. In each company, when a battalion is in line, a covering serjeant is always stationed behind the officer commanding the company; when the ranks take open order, and that officer advances before the front rank, the serjeant steps into his place; but upon the ranks being closed, he falls again to the rear. Four or six serjeants are charged with the important duty of guarding the colours of the regiment: they constantly attend the officers who carry them, and are called colour-serjeants. One serjeant in each troop or company is appointed to pay the men, also to keep the accounts relating to their allowances, the state of their necessaries, &c.

The name of sergens or servientes was, in the armies of France during the reign of Philip Augustus, applied to gentlemen who served on horseback, but were below the rank of knights; and also, as a general term, to the infantry soldiers who were furnished by the towns. There was, besides, a body of troops consisting of 150 or 200 men of rank, who were called sergens d'armes, and were instituted by the prince just mentioned for his protection, when in the East, against the subjects of the chief of the Assassins. (P. Daniel, *Hist. de la Milice Fr.*, liv. iii., ch. 7, and liv. ix., ch. 12.)

Corresponding to this corps was the body of serjeants-at-arms, which was instituted in England by Richard I., and appointed to guard the royal tent in complete armour. At first it consisted of twenty-four men, but the number was afterwards increased. Being accused of extortion and oppression, the parliament made several applications to the king that their number might be diminished, and in the reign of Edward IV. the desired reduction took place. (Grose, *Mil. Antiq.*, vol. i., p. 199.)

In the reign of Philip and Mary the serjeant-major of the army was an officer whose post corresponded to that of the modern major-general; and the serjeant-major of a regiment was a field-officer, who would now be designated the major. At present the serjeant-major is an assistant to the adjutant, and keeps the roster for the duties of the serjeants, corporals, and privates. The quartermaster-serjeant is one who acts immediately under the quartermaster of a regiment in all the details relating to the quarters of the officers and men, the supplies of food, clothing, &c.

SERJEANT, or **SERGEANT** (*Serviens*). This term, in its original signification, has long become obsolete. It would however be difficult to trace the connection between the different officers to whom the term is now applied without going back to their common type.

The terms serviens and servicium appear to have been applied at first to all servants of the public, or of the crown, as the head of the state, and to the service rendered by them as an acknowledgment or render for the lands held by such service. Rent paid by a tenant to his landlord is still distinguished by the name of rent-service [Rent] from other annual payments charged upon land, &c. The word 'serjeant' comes to us from 'sergent,' into which the French had modified the Latin 'serviens.' The word serjeanty, in French 'sergenterie,' was formed from 'sergent,' but was always used with reference to a particular species of service.

The complete development of the feudal system which followed the Norman conquest, was greatly facilitated by those political struggles which terminated in placing large portions of the lands of the kingdom in succession at the disposition of the crown. The forfeited lands of the revolted English were granted by the Conqueror to his followers with few exceptions, subject to the performance of personal services regulated by the quantity of the land granted and the rank and qualification of the grantee. The services ordinarily reserved upon grants by the crown, and upon those made by inferior grantors to their military followers, were of a military character. Where the grant was to hold by the service of a knight's fee, or of two or half a knight's fee, &c., without expressing the nature of the service to be performed, the party was said to hold by knight's service, *per servicium militare* [Knight's Service]; but where some *particular* service was to be performed by the tenant, or by some duly qualified person provided by him—as, to be an earl or baron of the realm, to lead the king's host, to assist in the defence of a certain castle, to wind a horn upon an invasion, &c.—the tenure was called tenure by serjeanty (*per serjeantiam*), and the grantee became a tenant by serjeanty, and would be a serjeant (*serviens*). Whilst the two tenures were always distinguished by the two appellations of 'serjeantia' and 'servicium militare,' the term 'serviens' or 'serjeant' was applicable to a tenant belonging to either class who had not taken upon himself the order of knighthood.

As the tenant by serjeanty was commonly distinguished by some title derived from the nature of his service—as earl, baron, constable, marshal, treasurer, &c.—the name 'serjeant' was usually applied, not to those who held in serjeanty, but to those who held *per servicium militare* generally, and had not been knighted. Thus in 1348 the four knights impannelled on a grand assize were told by the judge that they should elect no serjeants whilst they could find suitable knights (M. 22 Edw. III., fo. 18); and in 1352 the four knights, not being able to elect twelve other knights, were allowed, by the assent of parties, to elect of the most wealthy serjeants (H. 26 Edw. III., fo. 57, pl. 12). (These two cases have been strangely misunderstood by Dugdale and others, as if they related to an exemption of serjeants-at-law from the burthen of serving upon a grand assize.) So, an ordinance was made in parliament in the reign of Edward III. (1362), by which the return of lawyers to parliament, as knights for counties, was prohibited, on the ground that they acted with a view rather to the benefit of their clients than to that of the public, and the elections were directed to be made of knights and of serjeants of the most value. The term serjeant is also applied to those inferior military tenants, in the grant of a subsidy in 1379, in which serjeants and franklins of the county are assessed at 6*s.* 8*d.*, or 3*s.* 4*d.*, according to their estate, whilst serjeants at law are assessed at a fixed sum of 40*s.*, being twice the amount of the assessment of barons of the realm. (3 *Rot. Parl.*, 58.)

The serjeant holding *per servicium militare*, if possessed of sufficient land, was however bound, when called upon, to take upon himself the obligations attendant upon the order of knighthood. The tenant, or expectant tenant of such an estate, who wished to qualify himself for the creditable discharge of knightly duties, usually entered upon a course of training in the capacity of esquire to some knight, into whose service he was induced to enter by considerations arising from family connection, tenure, or friendship, or from the opinion entertained of his military fame. Although from the time of the Conquest down to the latter end of the reign of Edward III. all military tenants who had not been knighted are designated 'serjeants,' we find that after the first years of the reign of Richard II. the term serjeant, as applied to the unknighted tenant by knight's service, disappears, and is succeeded by the 'esquire,' a term previously used not to designate a class of persons occupying a certain rank, but an office actually performed. (*Abb. Rot. Origin.*, 209, b.) The services of the serjeant of the fourteenth century, and those of his successor, the esquire of the fifteenth, were alike estimated as equal to one half of the service of a knight-bachelor, or one-fourth of the service of a knight-banneret.

A special service of a military character, to be performed by the tenant or his sufficient deputy, was not less noble than the ordinary knight's service, and was sometimes called chivalerian serjeanty, but more commonly grand serjeanty. It is said indeed by Littleton (s. 153) to be a greater and more worthy service than the other. But any service, military or civil, which was to be performed by the tenant or his deputy to the king himself, was, on account of the dignity of the king's person, accounted a grand or chivalerian serjeanty. Thus in the Germanic body, the offices of arch-chancellor, arch-treasurer, arch-butler, &c. of the empire, attached to particular electorates, were of equal dignity with that of arch-marshal of the empire held by another elector; and in England the civil office of lord high treasurer, &c., the military office of lord high constable, &c., and the mixed office of lord high steward, &c., and that of earl, or baron, by tenure, are, or were, all equally held by grand serjeanty.

Lands held by serjeanty, on account of the entire nature of the service, could not lawfully be aliened or divided. This however was by a species of connivance frequently done in fact. The course was for the crown to issue a commission to fix a rent upon the alienated serjeanty, or the divided portions. By this process tenancies in serjeantry gradually became nearly extinct before the abolition of military tenures. Sometimes, upon the escheat or forfeiture of a serjeanty, the lands were granted by the crown, to hold by knight's service, whereby the special service of the serjeanty was lost.

Where the services reserved upon the tenure bore some relation to war, but were required neither to be executed personally by the tenant or his deputy, nor to be performed to the person of the king, as the payment of rent in spurs, arrows, &c., the tenant was said to hold by *petty* serjeanty, which was a socage tenure, having the same ignoble or non-military incidents as a tenure upon which an annual rent in money, corn, &c. was reserved, though considered to be of a somewhat more dignified character.

The tenant in serjeanty was bound either to perform the special service himself or to provide a person competent to discharge it. Sometimes, the land having descended to or been acquired by a citizen or a burgess, the service was considered of too great dignity to be performed by the tenant upon whom the duty of the serjeanty had thus devolved; in which case he was required to appoint a competent substitute. It happened more frequently however that the service to be performed was below the serjeant's rank, in which case it was permitted and expected that the service should be performed by deputy. This became so much a matter of course, that we find lands held in serjeanty commonly described as held by the service of procuring (per servicium inveniendi) persons to do the duty. This frequently happened with regard to the inferior offices relating to the administration of the law, as in the ordinary case of a tenure by the service of finding bailiffs itinerant. With respect to this particular appointment and some few others, the name itself was transferred from the appointer to the appointee, and the designation of serjeant was given to the person by whom the service of the serjeanty was actually performed. Hence our serjeants-at-mace, and other similar officers in Normandy and in England. In like manner, the sheriff being the ballivus of the county, that is, the person into whose custody or bailiwick the county is *bailed* or delivered, the inferior officers whom he employs have acquired the name of bailiffs. However humble the nature of the service may have been, the tenant was bound to perform it in person, in case no substitute could be obtained.

Among the civil services the performance of which was provided for by the creation of serjeanties, one of the most important was the administration of justice. Both in Normandy and in England numerous grants of lands were made, to which grants the obligation to discharge certain judicial or ministerial duties was annexed in lieu of the ordinary knight's service. In both countries it would appear that all counties, as well as the more important cities and boroughs, were placed under an officer of the crown who held lands by the tenure of administering justice in criminal matters. This local judge was in England called the king's serjeant (serviens regis), or the serjeant of the county, city, or borough; sometimes (stat. Westm. I., c. 30) serjeant in fee: sometimes capitalis serviens of the county (*Rot. Pat.*, 236) or of the hundred (*Testa de Nevil*, 409 d).

Lands held by this tenure are commonly described in antient records as lands held per serjeantiam tenendi (sometimes custodiendi) placita coronæ. It appears from Bracton, fol. 157, that this officer (the king's serjeant) had a concurrent jurisdiction with the sheriff, and that their records were equally incapable of being controverted. These serjeants had officers under them, who, taking the denomination of serjeant from the hereditary officer whose authority was in part delegated to them, were in counties known by the name of serjeants of the sword, sergens de l'espee, servientes ad spatam, and in cities and boroughs, by the name of serjeants-at-mace, servientes ad clavam. In the course of time, as charters were obtained, the citizens and burgesses acquired the right of choosing their own magistrates; and the king's officer, the serjeant, was superseded by the municipal officers, the mayor and aldermen. It is said that Norwich had no magistrate, except the king's serjeant, until the seventeenth year of king Stephen. (Stow, 214; Spelman, *Gloss.*) It sometimes happened that after the incorporation of the city or town, the serjeant continued to be the judicial officer *de facto*, sitting as assessor to the municipal magistrates. This was the case at Oxford. (*Harleian MSS.*, 298, fol. 56.) In London the office appears to have been retained; but a charter of 12 Edw. II. gave to the citizens the privilege of electing their *common serjeant*.

In counties the king's serjeant, as a judicial officer, may be traced to a much later period; and although the office is now become obsolete, and its principal functions have for centuries devolved upon the justices of the peace, proclamation is still made upon the execution of every commission of gaol delivery, inviting all persons to inform this officer of any treason, felonies, or misdemeanors committed by the prisoner at the bar.

Where the criminal jurisdiction of a particular district was annexed to a grant of land to a subject, the jurisdiction, though imposed as a condition and a burthen, was called a franchise [FRANCHISE], inasmuch as it excluded the ordinary power of the officers of the crown. The grantee was said to hold in frank serjeanty, en franché sergenterie; and in respect of the lands attached to the office, this serjeanty was in Normandy sometimes called une sergenterie glèbée. For the actual administration of justice, the tenant usually delegated his judicial authority as serjeant to an officer of his own, who was therefore called *his* serjeant, or the serjeant of the district (*Mad. Exch.*, 103; *Testa de Nevil*, 389), or serjeant of the peace for the district. (Cowell, *Interpr.*) Hence, the steward of a private leet, or of a manor to which a leet is attached, to whom the lord always delegates his judicial power, is sometimes designated as serviens sive senescallus. (4 Co., *Rep.*, 21.) Latterly, indeed, it has been considered that a tenure by serjeanty could only be created by, and held under, the crown. (Co. Litt., 108 a.) This was not the case however in the time of Henry III., as appears by Bracton (35 b.).

The tenure, by which lands were held by a 'serjeant of the county,' or 'serjeant in fee,' was a serjeanty belonging to that class which was called grand serjeanty, as being connected with the administration of justice. Edmund, earl of Lancaster, brother of Edward I., died seised 'de magna sergeantia totius comitatus de Derby.' (*Calend. Inquis. post mortem*, 136 b)

But the serjeants of counties were neither the only nor the most numerous class of serjeants-at-law. The main branch of that body remained in attendance upon the king. Their duty was to assist in the proceedings of the Aula Regia, the great court of justice of the realm, as assessors to the chief justiciar, and as advocates for the suitors, who being generally unacquainted with the language in which the proceedings of the court were carried on, were seldom able, and were never permitted, to plead their own causes. (1 *Rot. Parl.*, 4 a; 2 *Rot. Parl.*, 140.) Upon the breaking-up of the Aula Regia into the several courts which now occupy Westminster Hall, the serjeants-at-law became the justices of the courts of King's Bench and Common Pleas, and acted as advocates for the suitors, when not appointed to those offices, and when removed from them. While not employed in judicial stations, they were called serjeant-countors, servientes-narratores, and banci narratores, countor (narrator) being a term derived from the Norman 'conteurs,' persons whose office it was to conduct the causes of litigants in court, the verb 'conter' being applied indifferently to the pleadings on the part of the plaintiff and those on the part of the defendant.

It does not distinctly appear whether any grants of land were annexed to the office of serjeant-countor; if not, it is probable that the Conqueror, or some of his early successors, considered the fees receivable by the serjeant-justices and the serjeant-countors as equivalent to a grant of lands, and as constituting a serjeanty not attached to a tenure of land, or a serjeanty in gross. However this may be, the kings exercised the right of creating both serjeant-justices and serjeant-countors. The appointment of serjeant-countor has, from the earliest period, been effected by the royal mandate under the great seal; by writ, where the party to whom it was addressed was required to serve the king and his people in the Aula Regis, and afterwards in the courts of Westminster Hall; by letters-patent, with respect to serjeants in Ireland. Under this appointment, the serjeants were the sole public pleaders. They were the only persons in the state entrusted with the exercise of the ordinary judicial functions, and even now no person can be appointed a justice of the Queen's Bench or Common Pleas, who is not of the degree of the coif, that expression being derived from the peculiar species of cap which was, and still is, the distinguishing dress of serjeants-at-law. The barons of the Exchequer, who were formerly merely officers of revenue, are not required to be taken from amongst the serjeants; but unless they be of the degree of the coif, they are not qualified to act as justices of assize. Though not only all the serjeants on the circuit, but also the king's counsel, and occasionally other barristers, are included in the commissions of oyer and terminer and gaol delivery, and assist in the trying of prisoners when the judges are pressed for time, or if it is thought desirable to relieve the county from the expense arising from the detention of prosecutors and witnesses, the name of no person who is not a serjeant can be inserted in the commission of assize, to which the power of trying civil causes at nisi prius is annexed by 13 Edw. I., st. i., c. 30. Hence all civil actions at the assizes, which are not tried by one of the ordinary judges, can be tried only before a serjeant.

Much obscurity however still hangs over the origin of the connection between the terms serjeant and countor. It has been suggested that upon the introduction of the Norman conteurs into England, they were formed into a lay brotherhood, somewhat analogous in form to the religious communities by which they were surrounded; that the members of this brotherhood were admitted by royal authority, and employed in different capacities as judges and advocates about the Aula Regia; and that they probably derived their adjunct title of servientes from the nature of their employment, and from the circumstance of their appointment being conferred by the crown, and of its being considered that the services which they rendered were of equal dignity and importance with services reserved upon those tenures by grand serjeanty to which administration of justice was attached, and the tenants of which were in strict propriety denominated serjeants.

Upon the calling of every parliament, the judges and serjeants are summoned by writ to give their attendance. Their principal duty appears to have been to assist the lords in the trials of petitions. ('Rot. Parl.' *passim*.) The writ of summons issues to the judges, not as judges, but as serjeants; and if a baron of the Exchequer be not a serjeant, as was formerly often, and still may be, the case, he is not summoned. No serjeants have been required to attend of late years, except judges and king's serjeants, but formerly other serjeants were also summoned.

Whilst the Aula Regis constituted one court, a secular class of advocates was little needed; and upon that court being afterwards divided into different sections or branches, no inconvenience appears to have been felt, as all the different sections of the court equally followed the person of the king. But when, in the reign of Edward I., the regulation for holding common pleas, that is, all *civil* actions, in some certain place to be appointed by the crown, was put in force, parties who had business in the court of King's

Bench, the jurisdiction of which, except occasionally as a court of appeal, was then almost confined to criminal matters, or in the court of Exchequer, the jurisdiction of which related to matters of revenue, or in the court of Chancery, were put to inconvenience for want of advocates, as often as the king, whose progresses these courts still followed, happened to be distant from the place (usually Westminster Hall, and seldom elsewhere, after the reign of Edward III.) at which the court of Common Pleas sat. To remedy this inconvenience, and at the same time to relieve parties from the burthensome duty of appearing in person in the court of Common Pleas, an ordinance was made in Parliament, in 1292, by Edward I., by which the king directed the selection of a number (fixed provisionally at 140) from the higher class of legal students to act both as attorneys in the stationary court of Common Pleas, and as advocates in the comparatively few cases which then required their assistance in the ambulatory courts of the King's Bench, Chancery, and Exchequer. No distinction is made in the ordinance between attorneys and apprentices, and the 140 appear to have acted indiscriminately (2 *Rot. Parl.*, 96) as attorneys and as advocates, as their services happened to be required. Complaints were however still made in Parliament (1364-5) of the prejudice arising to parties implicated in proceedings in the two latter courts, from being unable to procure the assistance of serjeants; and it was prayed, though unsuccessfully, that on this ground these courts might also be made stationary.

A petition of the Commons in 1343, that parties to suits in the Marshalsea might be allowed to plead their own causes in that court, in order that they might not be delayed for want of serjeants, had met with a more favourable reception, and the permission was granted by an act of parliament (2 *Rot. Parl.*, 140), which act was not in print till the parliament rolls were published at the commencement of the present century. It was a punishable contempt of the court for a person to interfere as advocate without possessing a legal title to the office. (*Abb. Placit. in Dom. Cap. Westm.*, 137.)

It is stated in the article Barrister that serjeants and apprentices at law were supposed by Dugdale to be the same persons. Dugdale relies upon the circumstance that in the second year of Henry VI. an apprentice was heard in the court of Common Pleas, where serjeants alone practised. But Dugdale was mistaken in supposing that the apprentice acted as an advocate in that court; for upon reference to the Year-Book (M. 2 H. 6, fol. 5, pl. 3), it will be seen that this apprentice was merely sent by the Exchequer into the Common Pleas to ask the opinion of the judges and serjeants in the latter court upon a point of law then depending in the Exchequer; upon which the judges of the Common Pleas consulted the serjeants, and the point was debated by judges and serjeants indiscriminately. The apprentice took no part in the discussion, but carried back the result to the Exchequer, upon which that court acted. It has also been supposed that Plowden and Carrel, who are spoken of as apprentices in 4 Eliz. (1562), were at that time serjeants. With respect to the former, the mistake arose from the circumstance that a writ issued to Plowden and eleven others, in October, 1558, calling upon them to be made serjeants in Easter following. Mary dying in November, 1558, the writs abated. In 1559 fresh writs were issued by Elizabeth to seven of the eleven, but the names of Plowden and four others, as may be seen in Dugdale, were omitted. Plowden therefore remained an apprentice as before, and he is properly so designated in 4 Eliz. (1562). With respect to Carrel also, we have no distinct proof that he ever took the degree of serjeant, though it seems not improbable that he was often commanded so to do. John Carrel received a writ requiring him to take the degree of a serjeant in 1540, and again in 1552 and 1554. In what manner he was excused on these occasions, and whether he paid more attention to Mary's commands than he had done to those of her father and brother, or whether indeed the Carrel apprentice in 1562 was the same person with John Carrel, the serjeant thrice elect, does not appear.

The ordinance of Edward I. authorised only students who had reached the rank of 'apprentices at law' to practise as advocates in those courts in which the assistance of serjeants could not constantly be obtained; but as the practice of these courts increased, it was found necessary, in the reign of Elizabeth, to allow persons of less standing than apprentices to act both as advocates and as attorneys.

Students who, though not yet apprentices at law, had been admitted to argue fictitious cases at the mootings in their respective inns of court, were allowed to practise as advocates in the ambulatory courts of common law and equity. Advocates of this third class were called utter-barristers, because in arguing their moot cases by way of preparation for real forensic debates they were placed at the outer or uttermost end of the form on which they sat, and which was called the 'barr.' (Stow; Waterhous; Dugdale; Herbert, 'Antiq. Inns of Court,' 176.) The junior students, who sat in silence on the inside, were called inner-barristers. But the latter term has long been abandoned, and is sunk in the more general designation of student; in consequence of which the term utter-barrister has also given place to that of barrister, and the student who is admitted to that degree is said to be 'called to the bar.' This call however consists merely in the presiding bencher's saying, 'I publish you a barrister of this Society.'

The mere students, formerly called inner-barristers, confine themselves to study, or, when they consider themselves qualified, practise as conveyancers, special pleaders, or equity draftsmen, in which capacity they are recognised by the legislature, being required to take out annual certificates from the stamp-office. For nearly the last twenty years students practising as certificated special pleaders have been allowed to practise as advocates before judges sitting in their private chambers at Serjeants' Inn, for the summary despatch of matters of pleading and practice, &c.

Shortly after the permission given to barristers to practise as advocates, we lose sight of the order of apprentices. Though usual, it was never perhaps absolutely necessary that a student should become an apprentice in order to qualify him for being called to the degree of the coif; and when it ceased to be required as a title to practise as an advocate, there was no longer any motive for taking the degree of an apprentice.

The result of these inquiries seems to be, that from the Conquest to the 20 Edw. I. (1292), serjeant-countors were the only advocates; that from 1292 to the latter end of the sixteenth century, apprentices were allowed to practise in certain courts; that towards the close of the sixteenth century, the apprentices were supplanted by a more numerous class of junior students called utter-barristers and afterwards barristers; and that from the middle of the eighteenth century, mere students were at any time after their admission, and immediately upon their admission, allowed to practise as certificated conveyancers or certificated special pleaders; and that such special pleaders have latterly been allowed to practise as advocates before judges when administering justice in their private chambers; which latter practice may be thus explained:—The business to be disposed of by the courts at Westminster having far outgrown the machinery provided for its despatch, many acts of parliament have directed that certain judicial acts shall be done by the court 'or any judge thereof.' The consequence of these provisions, and of a practice existing before, of referring minor questions and cases of a pressing nature, to be disposed of by a single judge, has been that a most important part of the judicial business of the country, instead of being discussed, as formerly, in open court before a full bench, and with the assistance or in the presence of an intelligent bar, is commonly disposed of by a single judge in a private room, without any assistance except that which he can derive from the attorney's clerks on each side who attend the summons. It not unfrequently happens that a most abstruse point of special pleading, involving the fate, and sometimes the real merits of the cause, and which in the reign of Edward VI. would have been argued by learned serjeants and *sad* apprentices at the bar, and afterwards debated publicly on the bench, is disposed of in five minutes, and without appeal, at chambers by a judge who has never practised this branch of the law, and who would when at the bar have shrunk from the responsibility of expressing an opinion on the most ordinary question connected with the science of special pleading. It was therefore quite natural that judges should be glad to avail themselves at chambers of the assistance of special pleaders; and in order to prevent the abuse of the indiscriminate invitation given by the legislature to all persons, though students only of a day's standing, who are members of an inn of court, to take out licences to practise as special pleaders, &c., the benchers or governing members of some of the inns of court now require that upon the admission of a student, he shall engage not to practise as a special pleader, &c., till he be of sufficient standing to be called to the bar.

The serjeants are however the only advocates recognised in the court of Common Pleas. In that court they retain their right of exclusive audience. This privilege extends to trials at bar, but not to trials at nisi prius, either at the assizes or at the sittings in London and Middlesex.

Attempts have been made to place the court of Common Pleas upon the same footing in this respect as the other courts at Westminster. A suggestion to that effect was made by Sir Matthew Hale, in his 'Considerations touching the Amendments of the Law.' In 1755 it was proposed by Sir John Willes, then chief-justice of the Common Pleas, that the court should be opened to all barristers. The judges met, and, after much discussion, expressed their opinion against the plan, which was strongly opposed by Lord Hardwicke. The bill was not brought into parliament, and the scheme was dropped.

The following representation with respect to the abolition of the exclusive right of the serjeants to audience in the court of Common Pleas was made by the Commissioners on Courts of Common Law, in their first Report, 1829:—

'There can be little doubt that such abolition of the exclusive privilege would soon be followed by the entire annihilation of this very antient rank, the advantage of which to the profession at large appears to us to be considerable. It consists in its enabling gentlemen of certain standing and character in the profession, who conceive themselves to have pretensions to advancement (especially on the circuits), but who are not honoured with appointments as your majesty's counsel, to obtain, upon their own application, and without special favour, a certain precedence, and an exclusive right of audience in one court, attended with the relinquishment of general practice in others.

'This change of position is often attended with the most beneficial effects to the professional interests of the persons concerned, of which it would not be difficult to cite satisfactory or even splendid examples.

'With respect to the public, one inconvenience certainly appears to result from it, viz., that on motions for new trials on issues arising in the court of Common Pleas, barristers[*] not having the rank of sergeant, though they may have been engaged on the trial of those issues, are excluded from audience. Where no sergeant has been employed at the trial, which on the circuits is of frequent occurrence, this operates as a considerable grievance; and the exclusion of the only persons who have any personal knowledge of what passed upon the proceeding under review, gives rise to just dissatisfaction.

'We are therefore of opinion, that upon such motions, if the cause has been tried on the circuit, the barristers engaged on such trials, though without the rank of sergeant, should have audience in the court of Common Pleas; and as a compensation to the gentlemen of the coif, we recommend the abolition of an established professional usage, which precludes any sergeant, though he may not be one of your majesty's sergeants, from opening the pleadings upon the trial of a cause at *nisi prius*.

'That usage rests on no reasonable foundation. Upon a trial at the bar of the court of Common Pleas, the pleadings are opened by the junior sergeant; and the present usage is attended with this public inconvenience, that it obliges the plaintiff, though desirous perhaps to employ a sergeant as his junior counsel, to confer that employment on some barrister of lower rank. But with the exception that has been stated, we do not think that the privilege which is enjoyed by the sergeants is in any respect objectionable; for the easy access to the rank sufficiently protects the public from all the evils which attend monopoly, and at the same time secures to the court of Common Pleas the advantage of a distinct bar. Of this advantage we have already expressed our opinion. The distraction occasioned by the engagements of counsel in several courts is prejudicial in various ways. The interest of the suitor is liable to be affected by the absence of his counsel at critical periods of his case; additional counsel are often retained, and consequent expense incurred, for the purpose of securing the presence of one who is fully instructed. Both these inconveniences are experienced, as we are informed, in a great degree, in Ireland, where it is usual for the counsel to practise in all the courts, and not a little in the courts of equity in this country; and the business in the court is often deranged, and its dispatch not unfrequently delayed, by the endeavours to accommodate the order of proceeding to the convenience of counsel, and by the necessity of reverting to matters which have passed in his absence.

'So long therefore as all barristers possessed of due qualifications, and willing to devote themselves to the practice of the Common Pleas, are enabled to obtain your majesty's writ calling them to the degree of sergeant, we believe that the character of the court for the satisfactory transaction of business will be better sustained by the continuance than by the abolition of the exclusive privilege.

'If access to the coif were less easy than it now is, the case indeed would be different; and supposing the difficulty in obtaining your majesty's writ to be increased, the effect might be to limit the number of practitioners in the court of Common Pleas in a manner which might operate very prejudicially to the public. The opinion above expressed proceeds therefore on the assumption that the present liberality on this subject is founded on an acknowledged principle of utility, and will continue to be observed.

'By way of further encouragement however to barristers to resort to the court of Common Pleas, we recommend that, in addition to the advantage proposed to be given to junior sergeants of opening pleadings, your majesty's sergeants should forbear to sign pleading, or to transact any other business from which your majesty's counsel in other courts, according to established usage, refrain.

'The principle of requiring counsel to elect some one court as the place of their regular practice, *for the purpose* of establishing an appropriate bar in each court, is necessarily applicable to such counsel only as obtain rank. But much inconvenience is likewise often experienced from the absence, during the trial of causes, of the junior counsel who have prepared the pleadings, and advised upon the case and evidence. To them the minuter details of fact, and the authorities upon which the action has been commenced, or the defence founded, are generally more fully known than to the leading counsel, who often receive their instructions a short time only before the trial. It is a very common though an inconvenient practice, for counsel, having engagements in different places at the same time, to place their briefs in the hands of their friends, who represent them at the trial of causes. But in such cases the counsel entrusted with the briefs, for want of previous acquaintance with the cases, are little able to afford assistance either to the judge or the leading counsel.

'It can hardly be expected, nor is it perhaps to be wished, that junior barristers should confine their practice to a single court; and it may be impossible for them to anticipate the course of business by which their attendance upon a particular cause in one court may be prevented by their unexpected detention in another. But we are of opinion that no gentleman at the bar ought to accept a brief in any cause upon which he has not good reason to be assured that he shall be able personally to attend.

'The permission to open pleadings proposed to be given to junior sergeants will tend materially to obviate the inconvenience above mentioned. But we think it right to call to notice an antient rule of the court of Common Pleas, of Hilary term, in the 14th year of King James the First, by which it is provided, "That if any sergeant or counsellor-at-law shall take any fee to be of counsel with any, and to be with him at any time certain for any cause, and shall not attend the same cause accordingly, that then, upon complaint made or information thereof given to the judges of that court where the cause shall be depending, or any of them, the judges by their discretion shall give order for the repayment and satisfaction thereof to the client."

'We think it very desirable that the principle of this rule should be honourably observed.'

In April, 1834, while the Central Criminal Court bill was in the House of Lords, a clause was introduced for opening the court of Common Pleas. This clause was withdrawn from the engrossment before the bill was sent to the Commons. But on the 24th of April, in that year, a royal warrant issued, ordering and directing that the right of practising, pleading, and audience in the court of Common Pleas should cease to be exercised exclusively by the serjeants-at-law, and that barristers-at-law should have and exercise equal right and privilege with them of practising, &c. in that court. The warrant professed to give to such of the serjeants then in practice as were not king's serjeants, and had not patents of precedence, *as an especial mark of royal favour*, precedence over any king's counsel who might be thereafter appointed. This warrant was filed in the court of Common Pleas on the 25th April, 1834; from which time, until January, 1840, it was acted upon by the court. During this period no persons applied for the coif, except those who had received an intimation that they were to be made judges.

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[*] The term 'barrister' is here used, as it sometimes is by the legislature, in its popular sense, as applicable to all persons practising at the bar of a court of law or equity, not including advocates in courts conducted according to the civil or canon law, but not confined, as from the derivation of the term might perhaps be inferred, to the class formerly known as 'utter-barristers.'

On the accession of Queen Victoria, in 1837, a petition was addressed to her majesty by the queen's serjeants and two other serjeants who had not availed themselves of the clause of precedence contained in the warrant of April 24, 1834, suggesting that the warrant was illegal, and praying that the legality of that document and the expediency of the alteration might be duly investigated. The illegality of the warrant was asserted upon the prescriptive rights of the serjeants, coeval with the existence of the courts themselves. The circumstance that the warrant did not purport to be countersigned by the secretary of state or by any other responsible officer was also relied on. On the score of expediency, it was alleged that the convenience of a fixed and resident bar in each court for the satisfactory despatch of business was known to all who regularly attended courts of justice; that to effect the object by any arrangement amongst the practitioners had been found to be impossible; that the interruption and loss of time to the court, and the delay and embarrassment of business, were the subject of general complaint; whereas by the legal constitution of the court of Common Pleas these inconveniences had been avoided as long as the exclusive right of audience of the serjeants in that court had been upheld. A memorial was at the same time presented to the lord chancellor, in which it was submitted that such an alteration could only be made by act of parliament.

The petition being referred to the judicial committee of the privy council for their advice, the question of the legality of the warrant was argued before the lords of the council on the 10th of January, 1839, and again on the 2nd of February following. A strong opinion was expressed by their lordships as to the illegality of the warrant, but the court separated without coming to any conclusion as to the advice which should be tendered to the crown.

In June, 1839, a bill was brought into the House of Lords, 'To regulate the course of proceeding in the court of Common Pleas, so far as relates to the practice and hearing of counsel therein in term time.' The object of this bill was to authorize the court of Common Pleas to hear barristers-at-law upon motions arising out of trials at the assizes. The bill passed the Lords, but was not moved in the Commons.

In November, 1839, a motion was made in the court of Common Pleas by Wilde, as the senior practising serjeant, that the exclusive right of audience of the serjeants-at-law for practising in that court, which had been suspended by that court in obedience to the warrant of 1834, should be restored; and at the close of Hilary term, 1840, the right of being heard as counsel and of signing pleadings in causes depending in the Common Pleas, was declared by the court to belong exclusively to the serjeants-at-law. It was however stated that, in order to prevent inconvenience to the suitors, the court would hear other counsel in causes in which they were actually engaged at the time the opinion of the court was thus pronounced.

Serjeants had formerly not only *exclusive audience* in the Common Pleas, but had also in all other courts *pre-audience* over all other advocates. They are addressed by the judges as brothers, by which title they speak to and of one another.

Though the king was represented in each of his courts at Westminster by one or more persons as his attorney and solicitor-general in one or all of those courts, no one formerly pleaded as *counsel* for the crown except serjeants. In the patent of a king's serjeant, he was appointed by the king 'Serviens Noster ad legem, et Narrator pro Nobis in curiis Nostris, in quibuscunque negotiis Nos tangentibus.' Afterwards when the king's attorney, as it usually happened, was an apprentice, he was allowed not only to appear as attorney, but to plead as advocate for the crown in those courts in which apprentices were permitted to practise, and when so employed he claimed and exercised, for the benefit of the crown, a right of pre-audience over serjeants pleading for ordinary clients in those courts. Afterwards the attorney-general exercised a right of pre-audience even when not engaged for the crown. Other king's counsel appear to have obtained pre-audience over the serjeants by a similar course of proceeding; but the king's serjeants still retain pre-audience over all other counsel except the attorney-general and solicitor-general; and even over the attorney-general, the senior of the king's serjeants, distinguished by the appellation of 'the king's antient serjeant,' retained his precedence until 1814, when Sir Samuel Shepherd, the king's antient serjeant, being appointed solicitor-general, instead of vacating his office of serjeant, as had always before been done in such cases, obtained a warrant from the Prince-Regent giving to the attorney-general and solicitor-general perpetual pre-audience of the whole bar. In the reigns of Mary, Elizabeth, and James I., several persons were degraded, or discharged, from the degree of serjeant-at-law in order to capacitate them for accepting the office of solicitor-general, as it is not unusual now for barristers to apply to be disbarred for the purpose of enabling them to practise as solicitors or attorneys to private suitors.

The pre-audience acquired, in comparatively modern times, by the attorney-general and solicitor-general and the other king's counsel over the serjeants in the courts of Westminster Hall, has not otherwise affected the rank or position of the latter. At the coronation of Queen Elizabeth it appears to have been finally settled that in the royal procession (in which those of inferior rank walk first) 'the attorney and solicitor-general walk immediately before the barons of the Exchequer, and immediately after the serjeants-at-law, who follow the knights-bannerets, bachelor-knights, masters of the chancery, clerks of the court, &c.' (Egerton *Papers*, 60.)

The serjeants formerly occupied three inns, or collegiate buildings, for practice, and for occasional residence, situate in Chancery Lane, Fleet Street, and Holborn. The last, called Scroop's Inn, has long been abandoned, and since the burning down of Serjeants' Inn, Fleet Street, in the middle of the last century, that site has also been deserted by the serjeants, who have now no other building than Serjeants' Inn, Chancery Lane, which has been lately rebuilt. Here all the common-law judges have chambers, in which they dispose in a summary way, and with closed doors, of such matters as the legislature has expressly entrusted to a single judge, and of all business which is not thought of sufficient magnitude to be brought before more than one judge, or which is supposed to be of a nature too urgent to admit of postponement.

The inn contains, besides accommodations for the judges, chambers for fourteen serjeants, the junior serjeants while waiting for a vacancy being dispersed in the different inns of courts.

In Serjeants' Inn Hall the judges and serjeants, as members of the Society of Serjeants' Inn, dine together during term-time. Out of term the hall is frequently used as a place for holding the equity and revenue sittings of the court of Exchequer.

Formerly very splendid and expensive entertainments were given by the new serjeants upon their reception into the order. About a century ago this custom was discontinued, and instead of festivities at their joint expense, each serjeant paid 100*l.* to the Treasurer of the Society of Serjeants' Inn upon his admission as a member of that Society, into which the new serjeants are elected almost as a matter of course. The payment is now raised to 350*l.* The practice of giving gold rings to the queen and the great officers of state and others still continues, though the number has been lately reduced. These rings, with the robes and other expenses, raise the 350*l.* to something less than 500*l.* The peculiar dress of the serjeants-at-law, besides their distinctive coif, consists in four species of robes. In term time the gown of black cloth is worn on ordinary occasions. On holidays the serjeants appear in court in purple (violet coloured) gowns. When they go in state to St. Paul's, they wear scarlet gowns, as also when they attend the House of Lords, if the king be present, and when they dine at Guildhall on lord mayor's day. At nisi prius they appear in black silk gowns, which, as being at hand, they generally wear when called upon to try causes or prisoners on the circuit, though for the latter purpose the scarlet gown, always accompanied with a *sentence cap*, is understood to be the appropriate costume.

The creation of serjeants was antiently attended with numerous ceremonies, a description of which may be seen in the last chapter of Herbert's 'History of Inns of Court.' Some practices belonging to an age of greater simplicity than the present, are still retained in those cases where the writ to the serjeant elect issues *in term time.* But by a late statute, 6 Geo. IV., cap. 95, persons receiving writs, issued *in vacation*, commanding them to appear in the Court of Chancery and to take upon themselves the estate and dignity of a serjeant-at-law, are, upon appearing before the lord chancellor and taking the oaths usually administered to persons called to that degree and office, declared to be serjeants-at-law sworn, without any further ceremony.

Another class of serjeants is that of serjeants-at-arms, whose number is limited, by statute 13 Rich. II., cap. 6, to thirty. Their office is to attend the person of the king, to arrest offenders, and to attend the lord high steward when sitting in judgment upon a peer. Two of these serjeants-at-arms by the king's permission attend the two houses of parliament. In the House of Commons, the office of the serjeant-at-arms (as he is emphatically called) is to keep the doors of the house, and to execute such commands, especially touching the apprehension of any offenders against the privileges of the Commons, as the house through its Speaker may enjoin. From these serjeants-at-arms the present regimental serjeants are probably derived.

The third field-officer in a regiment, now the major, was formerly called the serjeant-major [Major], a term now applied to a much inferior officer. In the Spanish service the major is still so designated.

In some offices about the royal person the principal officer of the department is distinguished by the appellation of serjeant, as the serjeant-surgeon, &c.

Many of the documents referred to in the present article are printed at length in the Appendix to Manning's 'Serviens ad Legem,' which is a report of the argument before the Privy Council in 1839.

Serjeants and other counsel are engaged to assist a party in a cause either by the delivery of a brief in that cause or by giving a retainer or retaining fee. A retainer, if for a particular cause, and for a particular stage of that cause is called a common retainer, and it now consists in the payment of the sum of one guinea and the delivering of a paper endorsed with the name of the cause and of the court, and the words 'Mr. Serjeant A (or 'Mr. B'), retainer for the plaintiff' (or for the defendant). A general retainer is where a retaining fee of five guineas is given to counsel to engage the assistance of that counsel in all causes in which the party retaining may be concerned in the courts which the counsel retained attends. A special retainer is where a large fee is given to counsel to plead in a particular cause on a circuit on which he does not usually practise. This fee, which, for the leading counsel, cannot be less than 300 guineas, besides the expense of posting with four horses to and from the place of trial, is given and received partly with a view to remunerate the counsel for the inconvenience of leaving other engagements to come to a strange circuit, and partly for the purpose of preventing any unnecessary interference with the business of the regular practitioners of the particular court into which he is brought, in cases which are not of great importance. Both the common and the special retainer amount to an engagement on the part of the counsel to accept the brief of the party retaining, and to refuse any brief offered by the adverse party, and on the part of the client, to deliver a brief to the counsel retained in case the cause is entered for trial, whether a trial takes place or not. A general retainer merely renders it imperative on the counsel retained to accept no brief or retainer from the adversary of the party retaining, until he has first ascertained that it is not the intention of the latter to require his services in the particular cause. The general retainer continues in force during the joint lives of the retaining client and the counsel retained, unless the engagement be cancelled by the former, who is at liberty at any time to renounce his title to the services of the counsel retained. In the case of a common or a special retainer, the contract can be put an end to only by the concurrent act of counsel and client.

In cases of importance, counsel are generally retained before the action is actually commenced; and it often happens that for want of sufficient information as to the form of the intended proceedings, or from carelessness, the cause is not described in the retainer with sufficient accuracy. When this is the case, the retainer is void, and the counsel is bound to accept the retainer of the adverse party, if tendered before the mistake has been corrected. The sufficiency of the first retainer becomes frequently the subject of dispute between the litigant parties, which dispute, if not arranged between themselves, is generally settled not by the counsel to whom the retainer is given, but by some other leading counsel.

In former times it was usual, particularly for great persons and public bodies, especially for religious corporations, to grant annuities pro consilio impenso vel impendendo.

SERJEANT-AT-ARMS. [Serjeant. (Law.)]

SERJEANT-AT-MACE. [Serjeant. (Law.)]

SERJEANTY. [Serjeant. (Law.)]

SERK. [Guernsey.]

SE'RLIO, SEBASTIA'NO, an Italian architect, whose writings are considered of authority in matters of art, was born at Bologna in 1475. The study of Vitruvius inspired him with an eager desire of obtaining greater insight into the practice of the antients, by examining and making drawings of what remained of their structures,—at that time the only method by which any knowledge of them could be acquired; for although many buildings were then to be seen in a perfect state in comparison with what they are at present, that advantage was counterbalanced by there being no accurate delineations published for the instruction of those who could not visit the edifices themselves. After staying some time at Pesaro, Serlio proceeded to the Venetian States, where he employed himself in examining and measuring the amphitheatre and bridges at Verona. He subsequently visited both Vicenza and Venice; erected a theatre in the former city, and in the other made designs for the church of San Francesco delle Vigne. During his residence in the last-mentioned city, he became acquainted with Sanmicheli, Sansovino, and other architects of note; and he himself would doubtless have found employment there, being noticed by the Doge Andrea Gritti, if his passion for exploring antiquities had not induced him to pass over to Pola, of whose amphitheatre and other Roman remains he was the first to publish any architectural account. On his return he examined those of Ancona, Spoleto, &c., and afterwards those of Rome, many of which are introduced as illustrations, but certainly not as embellishments, in his work on architecture, they being there represented in most coarsely drawn and executed woodcuts. It was while he was at Rome that he composed his treatise on the five orders, for a copy of which he was complimented by Francis I. with three hundred gold crowns. Invited to France by that monarch in 1541, he was there appointed architect at the palace of Fontainebleau, and was also commissioned to undertake the court of the Louvre, but generously declined in favour of Lescot, whose designs he recommended to be adopted as being superior to his own. After the death of his royal patron he retired to Lyon, where he remained for some time in exceedingly straitened if not in indigent circumstances; but he returned again to Fontainebleau, and died there in 1552. His reputation rests chiefly upon his writings, 'Opere di Architettura, Libri Sei,' which display more study and learning than taste; and which, highly as they were at one time esteemed, possess little real value at the present day.

SERMON, a form of the Latin *sermo*, which denotes a discourse of any kind, and even common talk or conversation. It is now however applied only to a discourse of a particular kind, namely, one delivered to an assembly of persons who are gathered together for purposes of devotion, or in the character of a Christian and religious congregation. Nor is any address delivered on such occasions properly a sermon, though the word is very loosely used, and addresses delivered on such occasions, which can hardly be called sermons, are not unfrequently so denominated; but it seems to be essential to a sermon that it shall be a discourse grounded on some particular passage of holy Scripture which more or less influences the preacher in the whole of his discourse. This passage is called the *text*, that is, it is the portion of the *text of Scripture*, of which the sermon is the long paraphrase and commentary, with suitable application and exhortation intermixed or appended.

This we believe to be the true idea of the word sermon, as contradistinguished from other words denoting discourses or addresses, and the most antient sermons are of this structure; and of this structure are also a great proportion of the sermons which are delivered in the churches and other places of Christian assembly. When the text is used merely as a motto, or when there is no reference to any particular portion of Scripture, the discourse may be very good and very edifying, but it is not properly a sermon.

The sermons delivered in the English church before the Reformation were very short, probably seldom requiring more than ten minutes for the delivery of them. Many specimens remain in manuscript, but few are generally accessible by having been printed. Perhaps the most remarkable and the most easily consulted are the sermons at the opening of each parliament, of which there are notices in the printed rolls.

But with the Reformation a great change in this respect took place; and in many cases the ministers of religion came to consider themselves rather as persons whose peculiar duty it was to exhort and preach, than to conduct the devotions of a Christian assembly and to minister the sacraments. The consequence of this was that the sermons ran out to a most inordinate length, and assemblies were gathered together rather for the purpose of listening to them than of entering into the devotions of the church; and the term 'preaching minister' was invented to designate those ministers who changed the nature of their office, from one which was instituted for the administration of the Christian ordinance and the assisting the people in their devotions, to one which was of teaching, if not exclusively, yet principally. It was not very unusual in the seventeenth century for congregations to listen to sermons which occupied one, two, or even three hours in the delivery. Many of these sermons are in print, and may therefore be now read and judged of.

There is a singular work by a minister of the French Reformed church at Charenton, Monsieur Claude, entitled 'An Essay on the Composition of a Sermon.' This was translated by Robert Robinson, a Baptist minister at Cambridge, who has illustrated the rules by numerous quotations from English sermon writers. This translation is in two volumes, 8vo., 1779.

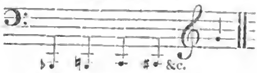
SE'ROLIS. [Isopoda, vol. xiii., p. 52.]

SEROUS MEMBRANES. [Membrane.]

SERPENS (the Serpent), a constellation which is astronomically distinguished from Ophiuchus, but not mythologically, being the serpent carried by the Serpent-bearer. The windings of the figure bring it in contact with Aquila, Ophiuchus, Libra, and Hercules.

Character. Not in Bayer ( )	No. in Catalogue of		Magnitude.	Character. Not in Bayer ( )	No. in Catalogue of		Magnitude.
	Flamsteed. (Piazzi.)	Astron. Society.			Flamsteed. (Piazzi.)	Astron. Society.	
	1	1696	7	ρ	38	1809	5
	3	1727	6½	γ	41	1819	3
	4	1729	6		43	1834	6
	5	1736	6	π	44	1832	4
	6	1743	6	(g^1)	45	1843	6
	7	1745	7	(g^2)	46	1844	6
τ^1	9	1748	6		47	1846	6
	10	1751	6		48†	1855	6
	11	1761	6	σ	50	1873	5
δ	13	1767	3		51‡	1883	6
A^1	14	1772	6	ν	53	1985	4
τ^3	15	1771	6	ξ	55	2019	4
	16	1775	7	ο	56	2028	5
τ^5	18*	1776	6	ζ	57	2061	5½
τ^6	19*	1783	6	η	58	2109	3
χ	20	1784	6	*d*	59	2124	6
ι	21	1785	5	*c*	60	2129	6
τ^7	22	1786	6	*e*	61	2139	6
ψ	23	1789	6		62	2184	6
α	24	1791	2		63	2188	3
A^2	25	1794	6		64	2193	6
τ^8	26	1793	6		(156)	2018	6½
λ	27	1795	4		(188)	2031	7
β	28	1796	3		(212)	1817	6
μ	32	1799	4	b^1	(222)	1822	6
ω	34	1802	6		(237)	2189	5
κ	35	1801	4		(281)	2050	7
b	36	1804	6		(293)	2051	6
ε	37	1803	3				

SERPENT, a musical instrument, a long conical tube of wood covered with leather, having a mouth-piece, ventages, and keys, and bent in a serpentine form; hence its name. The compass of the serpent is from B flat below the base staff, to G, the treble clef line, including every tone and semitone between these extremes. Or—



The use of this is confined to military bands, though it might have been rendered valuable in the orchestra. The ophecleide however, an instrument applicable to the same purposes, but of far superior utility, has already obtained a place in the concert-room, and will, most probably, soon supersede altogether its antient and imperfect precursor. [Ophecleide.]

SERPENTA'RIA. [Aristolochia.]

SERPENTINE, a rock regarding whose origin geologists have differed and perhaps still somewhat disagree in opinion. MacCulloch, in his 'Treatise on Rocks,' p. 243, denies that it is ever really stratified: in the same work, p. 652, he allows that important fact, from personal examination of a large tract in the island of Uist. It is described as an irregularly overlying mass in the Lizard district of Cornwall, as a dyke at Portsoy, and as nodular aggregations in the granite of Aberdeenshire. The relation in which it stands to diallage rock (a compound of diallage and felspar) is very intimate, both in the Alps, in the Shetland Isles, and in Cornwall. In fact the composition of these rocks is scarcely more different than may be seen between largely crystallised and fine-grained greenstone. Veins and masses of trap on passing through or being in contact with limestone not unfrequently change the nature of that rock near the junction, and either fill it with serpentinous lines or masses, or produce therein asbestic or steatitic admixtures. It is a very common circumstance among the primary limestones to find light green veins and strings of serpentine, and in the Pyrenees calcareous rocks comparatively of very recent date are similarly altered.

SERPENTS, or **OPHIDIANS**, an order of Reptiles without feet, and consequently, as Cuvier observes, more deserving of the name of *reptiles* than any other order.

Organization.

Cuvier's second family (the first being the *Anguians*) [Blindworm; Javelin Snake; Saurians], or that of the *True Serpents*, comprehends the genera which have no sternum nor any vestige of a shoulder-blade, but whose ribs still embrace a great part of the circumference of the trunk, and the body of whose vertebræ are also articulated by means of a convex surface which is received into a socket or concavity of that vertebra which succeeds it. They want the third eyelid and the *tympanum;* but the *ossiculum auditûs* exists under the skin, and its shaft or handle (so to speak) passes behind the tympanic bone. Many have vestiges of a posterior member under the skin, and the extremity of this rudiment of a limb shows itself externally in the form of a small hook. [Boa, vol. v., pp. 22, 27.]

Those serpents to which the names of *Doubles Marcheurs* or *Amphisbænidæ* [Amphisbæna and Typhlops] have been given, have the lower jaw carried, as in the Chelonians and Saurians, by a tympanic bone which is articulated directly with the cranium, the two branches of that jaw soldered anteriorly, and those of the upper jaw fixed to the cranium and the intermaxillary bone, so that their mouth cannot be dilated, as in Cuvier's next tribe (the Serpents properly so called), and their head is of uniform size with their body; a form and structure which enable them to make progress equally well in both directions, head or tail foremost. The bony frame of the orbit is incomplete backwards, and their eye is very small. Their body is covered with scales, the anus very near its extremity, the trachea long, and the heart placed very far backwards. Of this tribe no venomous species are known.

The Serpents, properly so called, have the tympanic bone, or pedicle of the lower jaw, moveable, and nearly always suspended to another bone analogous to the mastoïdian, attached to the cranium by muscles and ligaments which permit its mobility: the branches of this jaw are not united to each other except by ligaments, nor are those of the upper jaw united to the intermaxillary bone in any other manner, so that they can be more or less separated, a conformation which gives these animals the power of dilating their mouth to such an extent as to enable them to swallow bodies larger than themselves. Their palatine arches participate in this mobility, and are armed with pointed teeth curved backwards,—the most marked and constant character of this tribe. Their trachea is very long; their heart situated very far backwards; and the greater number have only one very long lung, with the vestige of a second. These Serpents, says Cuvier in continuation, are divided into *venomous* and *non-venomous;* and the former are subdivided into *venomous with many maxillary teeth*, and *venomous with isolated fangs*. In the *non-venomous*, the branches of the upper jaws are furnished throughout their length, as well as those of the lower jaw and of the palatine branches, with fixed teeth which are not pierced: there are therefore four nearly equal rows of these teeth in the upper part of the mouth, and two in the lower. [PYTHON, vol. xix., p. 175.] Those which have the mastoïdian bones comprised in the cranium, the orbit incomplete backwards, and the tongue thick and short, much resemble the *Amphisbænidæ* in the cylindrical form of their head and body, and have, Cuvier observes, been united to the *Orvets* [ORVET], in consequence of the smallness of their scales.

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* These stars are τ^2 and τ^3 of Flamsteed.

† More properly in Hercules than in Serpens.

‡ This star is really 24 Herculis.

The *venomous serpents* with isolated fangs present a very peculiar structure in their organs of manducation. Their superior maxillary bones are very small, carried on a long pedicle analogous to the external pterygoïd apophysis of the sphenoïd bone, and very moveable: here is fixed a pointed tooth, pierced with a small canal which gives issue to a liquor secreted by a considerable gland situated under the eye. It is this liquor which, when shed into the wound made by the bite of the serpent, carries havock into the body of the wounded animal, and produces effects more or less fatal according to the species which has inflicted the wound. This fang is concealed in a fold of the gum when the serpent does not wish to use it; and there are behind it many germs destined to fix themselves in their turn in order to replace it, if it should be broken in the wound it makes. Naturalists, Cuvier remarks, have named these teeth *crochets mobiles*, or moveable fangs, but it is, properly speaking, the maxillary bone that moves: that bone carries no other teeth, so that, in the venomous serpents, only two rows of palatine teeth are seen in the roof of the mouth. All the venomous species bring forth their young alive, in consequence of the egg being hatched internally before it is laid, whence their general name of *Vipers*, a contraction of *Vivipares*.

These deadly serpents with isolated fangs, though they present external characters of the same nature as the preceding group, have, the greater number of them at least, very dilatable jaws and a very extensible tongue. Their head, wide behind, has generally a ferocious aspect, which announces in some degree their malevolent nature. [VIPERIDÆ.]

A third tribe has the jaws organised and armed nearly as in the non-venomous serpents, but the species have the first of their maxillary teeth greater than the others, and pierced so as to conduct the venom in the same manner as is effected in the venomous serpents with isolated fangs. Such are the *Bungari* and *Hydri*. [HYDRUS; PELAMYS.] (*Règne Animal.*)

The serpents, with one exception (*Deirodon*, to which we shall presently more particularly call attention), subsist on living prey; and, whether non-venomous or venomous, have their teeth, as might be expected, admirably constructed and arranged for the purpose of securing their prey and assisting in deglutition.

Professor Owen, in his valuable and copiously illustrated *Odontography*, observes that the order *Ophidia*, as it is characterised in the system of Cuvier, requires to be divided into two sections according to the nature of the food and the consequent modification of the jaws and teeth. Certain species, he observes, which subsist on worms, insects, and other small invertebrate animals, have the tympanic pedicle of the lower jaw immediately and immoveably articulated to the walls of the cranium; the lateral branches of the lower jaw are fixed together at the symphysis, and are opposed by the usual vertical movement to a similarly complete maxillary arch above: these, as we have above seen, belong to the genera *Amphisbæna* and *Anguis*, Linn. The rest of the Ophidians, observes the Professor, which form the typical members, and by far the greatest proportion of the order, prey upon living animals, frequently of much greater diameter than their own; and the maxillary apparatus is, as we have also above seen, conformably and peculiarly modified to permit of the requisite distention of the soft parts surrounding the mouth and the transmission of the prey to the digestive cavity.

But the mechanism by means of which this distention is accomplished, and which is in fact a dislocation of adapted parts which return to their original positions when the act of deglutition is accomplished, requires, to be well understood, a more particular description than the general account above given, and we proceed to that presented by Professor Owen, as the best and clearest known to us.

The two superior maxillary bones have, he observes, their anterior extremities joined by an elastic and yielding fibrous tissue with the small and single intermaxillary bone: the symphysial extremities of the lower maxillary *rami* are connected together by a similar tissue, allowing of a still wider lateral separation. The opposite or posterior extremity of each ramus is articulated to a long and moveable vertical pedicle formed by the tympanic or quadrate bone, which is itself attached to the extremity of a horizontal pedicle formed by the mastoïd bone, so connected as also to allow of a certain yielding movement upon the cranium. The palatine and pterygoïd bones have similarly loose and moveable articulations, and concur with the other dentigerous bones of the mouth in yielding to the pressure of large bodies with which the teeth may have grappled.

Professor Owen first describes the dental peculiarities of the true serpents, which, as he remarks, swallow their food whole, whether they prey on living animals, as is the case in almost every species, or feed on the eggs of birds, as does *Deirodon scaber*, O. (*Coluber scaber*, Linn.). With the exception of this and some congeneric species, in which the teeth of the ordinary bones of the mouth are so minute as to have been deemed wanting, the maxillary and premandibular bones in all true Ophidians are, he observes, formidably armed with sharp pointed teeth; there is on each side of the palate a row of similar teeth supported by the palatine and pterygoïd bones: in the great Pythons and some species of Boa, he adds, the intermaxillary bone also supports teeth. But whatever be their position, all the teeth, according to the Professor, present a simple conical form, the cone being long, slender, and terminated by an acute apex, and the tooth is either straight, or more commonly bent a little beyond the base, or simply recurved, or with a slight sigmoïd inflection. Thus the teeth are adapted for piercing, tearing, and holding, not for dividing or bruising. Certain teeth in some species are traversed by a longitudinal groove, as above noticed, for conveying an acrid saliva into the wounds which they inflict; in others, two or more teeth are longitudinally perforated for transmitting venom: these poison-fangs, he remarks, are always confined to the superior maxillaries, as we have already stated, and are generally placed near the anterior extremity of those bones.

Professor Owen proceeds in the first instance to notice the serpents whose teeth are all simple and solid, where the pulp which occupies the basal cavity is calcified.

In the genus *Deirodon* (*Anodon* of Dr. A. Smith) the teeth of the ordinary bones of the mouth are so small as to be hardly perceptible, and they are so soon lost, that the animal has been described as toothless, whence Dr. Smith's name, which had already been appropriated to a genus of fresh-water *conchifera*. [NAIADES, vol. xvi., p. 63.] The office of this serpent is to keep down the increase of the smaller birds by preying on their eggs, and, as we shall presently see, the apparent defect is in reality one of those beautiful instances of adaptation of structure to the exigencies of the case to which every naturalist has so often to advert. 'If,' says Professor Owen, 'the teeth had existed of the ordinary form and proportion in the maxillary and palatal regions, the egg would have been broken as soon as it was seized, and much of its nutritious contents would have escaped from the lipless mouth of the snake in the act of deglutition; but, owing to the almost edentulous state of the jaws, the egg glides along the expanded opening unbroken, and it is not until it has reached the gullet, and the closed mouth prevents any escape of the nutritious matter, that the shell is exposed to instruments adapted for its perforation. These instruments consist of the inferior spinous processes of the seven or eight posterior cervical vertebræ, the extremities of which are capped by a layer of hard cement, and penetrate the dorsal parietes of the œsophagus: they may be readily seen, even in very young subjects, in the interior of that tube, in which their points are directed backwards. The shell being sawed open longitudinally by these vertebral teeth, the egg is crushed by the contractions of the gullet, and is carried to the stomach, where the shell is no doubt soon dissolved by the gastric juice.'

The same author observes that the simple teeth, 'dentes solidi,' as they are termed in herpetology, are of equal length in a few species of non-venomous serpents: in the Pythons, Boas, and Lycodons they are, he remarks, larger towards the forepart of the mouth; but in some Colubers and Tropidonotes the situation of the larger teeth is reversed. In *Dryophis* and *Psammophis* there are, he observes, a few very long teeth at the middle, and again at the posterior part of the maxillary series. In *Xenodon*, *Coronella*, and many species of *Homalopsis*, the posterior part of each jaw is, he states, provided with a large and simple tooth, which is long and compressed in the *Xenodon*.

Professor Owen describes the teeth of the *Boa Constrictor* as slender, conical, suddenly bent backwards and inwards above their base of attachment, with the crown straight or very slightly curved, as in the posterior teeth. The intermaxillary bone is described as supporting four small teeth; whilst each superior maxillary bone has eight much larger ones, which gradually decrease in size as they are placed farther back: in each premandibular bone are eight or nine teeth of similar size and proportions. Wide intervals separate these teeth, and from these intervals other teeth similar to those *in situ* have been detached. The base of each of the above teeth is described as extended transversely, compressed antero-posteriorly, and as anchylosed to a shallow alveolus, extending obliquely across the shallower alveolar groove. Professor Owen points out that an affinity to the Lizard tribes is manifested by the greater development of the outer as compared with the inner wall of the alveolar furrow. [SAURIANS.] The palatine teeth, of which there are three or four in each palatal bone, are as large as the superior maxillaries, and similarly attached: the pterygoïd teeth, five or six in number, which, Mr. Owen remarks, complete the internal dental series on the roof of the mouth, are of smaller size, and gradually diminish as they recede backwards; and he observes that in the interspaces of the fixed teeth in both these bones, the places of attachment of the shed teeth are always visible, so that the dental formula, if it included the vacated with the occupied sockets, would give a greater number of teeth than are ever in place and in use at the same time. The intermaxillary bone is, he informs us, edentulous in the smaller species of Boa.

The dentition of the great Java Python (*Python Amethystinus*) is figured after Cuvier in the article PYTHON, and Professor Owen takes his figure from the same authority, observing that the intermaxillary bone is represented as supporting four teeth; the superior maxillary being armed with eighteen teeth, but of these, the three which are situated on the inner side of the anterior part of the outer row are the successors of those teeth to which they are contiguous. No serpent, he remarks, has a double row of fixed and serviceable teeth implanted on the same bone. The palatine bone supports six teeth: the remaining eight teeth of the series are continued upon the pterygoïd bone. The premandibular element of the lower jaw carries eighteen teeth. Mr. Owen observes that in the Tiger Python (*Python Tigris*) the teeth are less numerous than in the great Python. The intermaxillary bone exhibits the places of attachment of four teeth, but Mr. Owen rarely found more than two in place: these in their size and curvature resemble the posterior teeth of the maxillary series. In each superior maxillary bone there are about twelve teeth, which gradually diminish in size as they recede backwards: the number of sockets is eighteen. On each palatine bone are six sockets, and, generally, four teeth in place; eight sockets on each pterygoïd bone, and five teeth in place. Professor Owen observes that the mode of fixation of all these teeth corresponds with that in the *Boa Constrictor*, and that their direction prevents the escape of the prey in which they are once fixed; while the separate and independent movement of each half of both upper and lower jaw, and of the dentigerous bones of the palate, allows of the different series of teeth being successively withdrawn, and implanted in a more advanced position in the prey, which is thus gradually drawn into the gullet, without the retaining force being unduly relaxed during any part of the engulphing process. The teeth seem to be more numerous, or there is a greater number in place at one time, he remarks, in the young, than the old individuals of *Python Tigris*: he counted fourteen superior maxillary and fifteen premandibulars in place on each side of the mouth, in an individual of this species six feet in length. The inner alveolar border is rather higher than the outer one in the palatine bones. The pterygoïd teeth are continued along the middle of the inferior surface or towards the outer side of those bones, whilst in the smaller colubriform serpents they are placed on the inner margin of the pterygoïds.

The teeth of both the Python and the Boa consist, according to the same author, of a body of firm dentine coated by a layer of cement, which is extremely thin upon the crown, but becomes thicker towards the expanded and attached base of the tooth. The calcigerous tubes radiate, he tells us, according to the ordinary course from the central pulp-cavity to the periphery of the tooth: the superior and central tubes proceed in the axis of the tooth; those nearest to them incline outwards, deviating from the axis as they recede from the point of the tooth, until they run at right angles to the axis, which course they maintain throughout a great proportion of the tooth. Their primary curvature is slight, with the concavity directed towards the tooth: their secondary undulations are faint and regular through seven-eighths of their course, but the tubes become bent in stronger and less sinuous curves in the rest of their extent, where alone they divide dichotomously, the terminal branches frequently inosculating in loops the convexity of which is directed outwards. These sinuous terminations of the calcigerous tubes give, he observes, a very peculiar appearance to the dentine of the Python, which, viewed by transmitted light in their sections by a low power, seems, at first sight, to be invested by a thick layer of some distinct tissue.

Professor Owen then adverts to the character detected by Retzius—the transmission from the lower or concave side of the main calcigerous tubes in the dentine of the Python, of numerous, minute, parallel, and nearly straight branches, directed obliquely outwards and downwards; and he informs us that the structure of the external layer of cement can only be examined in sections taken from near the base of the tooth, as its extreme thinness in the crown causes it to appear merely as a clear line bounding the peripheral loops of the calcigerous tubes. He adds that it appears to be more readily detached from the dentine where it is thickest, at the base of the tooth, and that it is a clear substance, in which the calcigerous cells are simple, very minute, and inconspicuous. Under the head *Coluber*, we are informed that the solid teeth of the smaller non-venomous serpents correspond in structure with those of the Python and Boa. In the *Eryx Turcicus* the largest and longest teeth are placed at the anterior part of the series, and they diminish as they recede backwards—the usual disposition: but in the common snake (*Natrix torquatus*) these proportions are reversed, and the largest of the maxillary teeth are situated at the posterior part of the series; whereas the teeth of *Coluber filiformis* are equal and small in size.

Dryinus, DENDROPHIS, and *Heterodon* are characterised by the disproportionate length of the last maxillary tooth; but *Dryinus nasutus* has, Professor Owen remarks, one tooth in the middle of the maxillary series as long as that which terminates it. The colubers, he observes, like other true serpents, have two longitudinal rows of teeth on the roof of the mouth, extending along the palatine and pterygoïds; the genus Oligodon appearing to form the sole exception to this rule. M. Duvernoy noticed a few small teeth on the transverse bone or external pterygoïd, as well as on the internal pterygoïd, in *Dryinus nasutus*.

Conducting us now towards the poisonous serpents, Professor Owen calls attention to the fact that in certain genera of non-venomous serpents, as *Dryophis*, *Dipsas*, and *Bucephalus*, in which the superior maxillary teeth increase in size towards the posterior part of the bone, the large terminal teeth of the series are traversed along their anterior and convex side by a longitudinal groove. In the *Bucephalus Capensis* the two or three posterior maxillary teeth present this structure, and are much larger than the anterior teeth or those of the palatine or premandibular series; they add materially therefore, he observes, to the power of retaining the prey, and may conduct into the wounds which they inflict an acrid saliva, but they are not in connection with the duct of an express poison-gland. The long grooved fangs are either firmly fixed to the maxillary bones, or are slightly moveable, according to their period of growth; they are concealed by a sheath of thick and soft gum, and their points are directed backwards. The sheath always contains loose recumbent grooved teeth, ready to succeed those in place.

In most of the Colubers, we are informed, each maxillary and premandibular bone includes from twenty to twenty-five teeth: they are less numerous in the genera *Tortrix* and *Homalopsis*, and are reduced to a still smaller number in the poisonous serpents, in the typical genera of which the short maxillary bone supports only a single perforated fang.

The transition to the poisonons serpents, which was begun in the *Bucephali*, and allied genera with grooved maxillary teeth, is, according to Professor Owen, completed by the poisonous serpents of the genera *Pelamys*, *Hydrophis*, *Elaps*, *Bungarus*, and *Hamadryas*, which latter genus, as its cervical integument can be expanded into a hood, constitutes an immediate link between the *Bungarus* and *Naja*.

The structure of the venom-fangs of serpents, and the machinery by which their deadly agency is brought to bear against those who are so unfortunate as to be the objects of their attacks, are so interesting, and the subject is so clearly treated by Professor Owen, that we should be doing injustice to his descriptions if they were not given in his own words, which we proceed to lay before our readers, only omitting certain notes and the references to the plates. The whole work should be carefully studied by the general physiologist, as well as by those who make the teeth their particular study.

'The superior maxillary bone diminishes in length with the decreasing number of teeth which it supports: the transverse or external pterygoid bone elongates in the same ratio, so as to retain its position as an abutment against the shortened maxillary, and the muscles implanted into this external pterygoid style communicate through it to the maxillary bone the hinge-like movements backwards and forwards upon the ginglymoid articulations, connecting that bone with the anterior frontal and palatine bones. As the fully developed poison-fangs are attached by the same firm basal anchylosis to shallow maxillary sockets, which forms the characteristic mode of attachment of the simple or solid teeth, they necessarily follow all the movements of the superior maxillary bone; when the external pterygoid is retracted, the superior maxillary rotates backwards, and the poison-fang is concealed in the lax mucous gum, with its point turned backwards; when the muscles draw forward the external pterygoid, the superior maxillary bone is pushed forwards, and the recumbent fang withdrawn from its concealment and erected.

'In this power of changing the direction of a large tooth, so that it may not impede the passage of food through the mouth, we may perceive an analogy between the viper and the lophius; but in the fish the movement is confined to the tooth alone, and is dependent on the mere physical property of the elastic medium of attachment. In the serpent the tooth has no independent motion, but rotates with the jaw, whose movements are governed by muscular actions. In the fish the great teeth are erect, except when pressed down by some extraneous force; in the serpent the habitual position of the fang is the recumbent one, and its erection takes place only when the envenomed blow is to be struck.

'The peculiar structure of the poison-fang was first described by Fontana, as it exists in the viper, and subsequently received additional elucidation by Mr. Smith's careful examinations of the fangs of the Hydrus, Naja, and Crotalus, and by Mr. Clift's illustrative drawings appended to Mr. Smith's paper. A true idea of the structure of a poison-fang will be formed by supposing the crown of a simple tooth, as that of a boa, to be pressed flat, and its edges to be then bent towards each other, and soldered together so as to form a hollow cylinder open at both ends. The flattening of the fang, and its inflection around the poison-duct, commence immediately above the base, and the suture of the inflected margins runs along the anterior and convex side of the recurved fang; the poison-canal is thus in front of the pulp-cavity. The basal aperture of the poison-canal is oblique, and its opposite outlet is still more so, presenting the form of a narrow elliptical longitudinal fissure, terminating at a short distance from the apex of the fang.

'The character most commonly adduced from the dental system, as distinguishing the venomous from the non-venomous serpents, is, that the former have two, the latter four rows of teeth in the upper jaw; the two outer or maxillary rows being wanting in the venomous species, and their place being supplied by the single poison-fang. The exceptions to this rule are however too numerous for its value as a distinguishing character in a question of such practical moment as the venomous or non-venomous properties of a serpent. In all the family of marine serpents the poison-fang is only the foremost of a row of fixed maxillary teeth. In the *Hydrophis striatus* there are four teeth, and in *Hydrophis schistosa* five teeth, behind the venom-fang, of rather smaller size than it; the two-coloured sea-snake (*Pelamys bicolor*) has also five maxillary teeth in addition to the perforated one. The poison-fang in this genus is relatively smaller than in the venomous serpents of the land, but presents the same peculiar structure. The poison-gland presents a correspondingly small development; it is pyriform, and its structure, according to Dr. Cantor,* is minutely cellular; it is covered by the aponeurotic expansion of the *articulo-maxillaris*, and transmits a straight duct horizontally to the basal opening of the venom-fang. It is a curious fact that the smaller non-venomous teeth of the poisonous serpents all present a trace of the structure of the functional venom-fang, being more or less deeply grooved along the convex anterior side; and in the hydrus this groove commences by a depression analogous to the oblique basal aperture of the poison-canal in the true fang.

'The colubriform poisonous serpents of the land have comparatively short venom-fangs, but they are larger than those of the pelagic serpents; and behind the venom-fangs there are likewise some smaller grooved teeth in the maxillary bones: there are three such teeth in the *Bungarus Pama*, and five in the *Bungarus annulatus*. In the *Hamadryas*, or great hooded poisonous tree-snake of India, the venom-fang is relatively as large as in typical poisonous serpents, but three or four smaller grooved teeth are implanted behind it on the maxillary bone.

'In the most deadly venom-snakes, as the viper (*Berus*), the puff-adder (*Vipera*), the asps or hooded snakes (*Naja*), the rattle-snakes (*Crotalus*), the cophias and fer-de-lance (*Trigonocephalus*), the poison-fangs acquire their largest size, and are associated only with their successors. These are clustered in greater or less number behind them, presenting the same structure, but of a size proportionate to their degree of development, and further differing in being loosely imbedded in the thick and wide mucous gum, which likewise conceals the fixed and functional fang in its ordinary position of retraction and repose. This fang is more strongly curved backwards than the ordinary teeth, but its acute and slender apex is frequently bent slightly in the contrary direction, as in the rattle-snake.

'The mechanism by which the short maxillary bone and the poison-fang are rotated backwards and forwards upon the ginglymoid joint that connects the maxillary with the præfrontal and palatine bones has already been noticed; and as some description of the secreting apparatus to which the peculiar modification of the venom fang is subservient might here be expected, I have selected for its illustration the accurate figure which Professor Muller has given of the salivary and poison glands in the *Trigonocephalus lanceolatus*, in his great work on the glandular system.†

'The poison-glands occupy the sides of the posterior half of the head; each consists of a number of elongated narrow lobes, extending from the main duct which runs along the lower border of the gland upwards and slightly backwards. Each lobe gives off lobules throughout its extent, thus presenting a pinnatified structure; and each lobule is subdivided into smaller secerning cæca, which constitute the ultimate structure of the gland. The whole gland is surrounded by a double aponeurotic capsule, of which the outermost and strongest layer is in connection with the muscles by whose contraction the several cæca and lobes of the gland are compressed and emptied of their secretion. This is then conveyed by the duct to the basal aperture of the poison-canal of the fang. We may suppose, that as the analogous lachrymal and salivary glands in other animals are most active during particular emotions, so the rage which stimulates the venom-snake to use its deadly weapon must be accompanied with an increased secretion and great distension of the poison-glands; and as the action of the compressing muscles is contemporaneous with the blow by which the serpent inflicts its wound, the poison is at the same moment injected with force into the wound from the apical outlet of the perforated fang.

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* 'Zool. Transactions,' vol. ii., p. 304.

† 'De Glandularum Secernentium Structura Penitiori,' fol., tab. vi., fig. 1, p. 55.

'The duct which conveys the poison, although it runs through the centre of a great part of the tooth, is nevertheless, as we have seen, really on the outside of the tooth, the canal in which it is lodged and protected being formed by a longitudinal inflection of the parietes of the pulp-cavity or true internal canal of the tooth. This inflection commences a little beyond the base of the tooth, where its nature is readily appreciated, as the poison-duct there rests in a slight groove or longitudinal indentation on the convex side of the fang; as it proceeds it sinks deeper into the substance of the tooth, and the sides of the groove meet and seem to coalesce, so that the trace of the inflected fold ceases in some species to be perceptible to the naked eye; and the fang appears, as it is commonly described, to be perforated by the duct of the poison-fang.

'From the real nature of the poison-canal, it follows that the transverse section of the tooth varies in form in different parts of the tooth; at the base it is oblong, with a large pulp-cavity of a corresponding form, with an entering notch at the anterior surface: farther on, the transverse section presents the form of a horse-shoe, and the pulp-cavity that of a crescent, the horns of which extend into the sides of the deep cavity of the poison-fang. A little beyond this part the section of the tooth itself is crescentic, with the horns obtuse and in contact, so as to circumscribe the poison-canal; and along the whole of the middle four-sixths of the tooth the section shows the dentine of the fang enclosing the poison cavity, and having its own centre or pulp-canal, in the form of a crescentic fissure situated close to the concave border of the inflected surface of the tooth. The pulp-cavity disappears, and the poison-canal again assumes the form of a groove near the apex of the fang, and terminates on the anterior surface in an elongated fissure.

'If the end of each inflected fold of cement in the tooth of the *Labyrinthodon* were dilated sufficiently to contain a tube, that tooth might convey the ducts of fifty poison-glands deeply imbedded in its substance, and yet all of them actually on the outside of the tooth itself: it is the existence of a single fold of the same kind, but more simple, inasmuch as it is straight instead of wavy, which forms the complication of the viper's fang subservient to the completion of its peculiar offensive weapon.

'The venom-fangs of the viper, rattle-snake, and fer-de-lance are coated only with a thin layer of a subtransparent and minutely cellular cement. The disposition of the calcigerous tubes is obedient to the general law of verticality to the external surface of the tooth. Since the inflected surface of the tooth can be exposed to no other pressure than that of the turgescent duct with which it is in contact, the tubes which proceed to that surface, while maintaining their usual relation of the right angle to it, are extremely short, and the layer of dentine separating the poison-tube from the pulp-cavity is proportionally thin. The calcigerous tubes that radiate from the opposite side of the pulp-cavity to the exposed surface of the tooth are disproportionately long.

'The pulp-cavity, following the form of the tooth itself, presents in a transverse section of this part the form of a fissure describing four-fifths of a circle; the fissure is widest at the middle and at the two extremities; the exterior calcigerous tubes, in quitting the pulp-cavity, form a graceful curve, the convexity being turned towards the nearest horn of the crescent; at the middle of the pulp-fissure the tubes proceed straight to the opposite surface; and at the two extremities of the crescent the central tubes are nearly straight, while the lateral ones radiate in graceful curves which become bolder as they diverge from the central and and straighter tubes. Throughout the greater part of the tooth the calcigerous tubes describe their various inflections in a plane transverse to the axis of the tooth; but towards the apex they begin gradually to rise from that plane; and as the pulp-cavity reassumes, with the tooth itself, the simple conical form beyond the termination of the poison-canal, the calcigerous tubes extend to equal distances from the linear remnant of the pulp-cavity, which has again passed to the centre of the tooth, and those tubes which are continued from its extremity pass to the apex of the fang in a line parallel with the axis of the tooth. The calcigerous tubes present secondary curvatures of a slightly wavy character, which become more marked and irregular near their termination. In whatever part of the section an entire tube could be clearly traced to its termination, it formed an anastomotic loop at the periphery of the dentine with an adjoining tube. The calcigerous tubes present a diameter of the $\frac{1}{15000}$th of an inch, and they are separated by interspaces equal to four of their own diameters. Each calcigerous tube gives off many primary branches in its course, but is rarely seen to divide dichotomously until it begins to form its irregular sinuosities near the periphery of the tooth. In the transverse section figured, the primary branches were sent off from the concave side of the tube, at an acute angle with the trunk; the secondary smaller and more numerous branches proceed from the same side of the main tube or of its primary branches, at a less acute angle, into the clear uniting substance; they are remarkably parallel with each other and straight. In old poison-fangs the pulp-cavity or fissure is obliterated by ossification of the remains of the pulp.

'The external layer of cement is very thin where it covers the crown of the tooth; it is best seen at the line of union of the co-adapted margins of the inflected tooth. At this part the cement is more abundant in the viper's tooth, and its transparency permits a bristle inserted into the poison-canal to be seen through it. The layer which coats the inflected surface of the fang is thinner than the outer one, which, from its transparency, has been regarded as enamel. There is however no trace of true enamel upon the teeth of the poisonous serpents, any more than upon those of the innocuous species. The cells of the cement are more minute and inconspicuous in the poison-fang than in the simple teeth of the Python and Boa.

'The teeth of all Ophidians are developed and completed in the original seat of the tooth-germs in all animals, viz. the mucous membrane or gum covering the alveolar border of the dentigerous bones. This gum presents the same lax tissue and is as abundantly developed as in the Pike, Lophius, and many other fishes, in which it likewise serves as the nidus and locality for the complete development of the teeth.

'The primitive dental papilla in the common harmless snake very soon sinks into the substance of the gum and becomes enclosed by a capsule. As soon as the deposition of the calcareous salts commences in the apex of the papilla, the capsule covering that part becomes ossified and adherent to the dentine, and the tooth begins to pierce and emerge from the gum, before its mould, the pulp, is half completed. Fresh layers of cells are successively added to the base of the pulp, and converted by their confluence and calcification into the tubular dentine, until the full size of the tooth is attained, when its situation in the gum is gradually changed, and its base becomes anchylosed to the shallow cavity of the alveolar surface of the bone.

'In the posterior part of the large mucous sheath of the poison-fang, the successors of this tooth are always to be found in different stages of development; the pulp is at first a simple papilla, and when it has sunk into the gum the succeeding portion presents a depression along its inferior surface, as it lies horizontally, with the apex directed backwards; the capsule adheres to this inflected surface of the pulp. But how the cylindrical cavity of the dilated fold is occupied in the loose growing poison-fang, and by what contrivance it is brought into the same relation with the severed duct of the poison-gland as the displaced fang which it succeeds, is not yet clearly understood.'

For the description of the teeth of the *Amphisbænians* and *Anguians*, see SAURIANS, vol. xx., p. 456.

From the consideration of the teeth we proceed to that of the other

Organs of Nutrition.—The *os hyoïdes* in the Ophidians bears a strong resemblance to that of some species of Saurians (IGUANA, *Draco* (DRAGON), *Lophyrus*, for instance); but the anterior part is double, and the two long osseous filaments which form it terminate in pointed cartilages, which introduce themselves, parallel, into the fleshy tissue of the tongue, and are separated by the hypoglossal muscle. The modifications of the muscles of the jaws are varied and admirably adapted to the purpose assigned to them. Some are appointed to work the venom-fangs by carrying forward the external pterygoid and superior maxillary bones; others again are employed in the separation, approximation, and adjustment of the mandibular bones and the whole of the maxillary articulation; nor are those which act upon the tongue and *os hyoïdes* less complicated; whilst the peculiar muscles which come from the vertebræ and ribs all assist in the process of deglutition. The mobility of the tongue of the serpents must have struck every observer, and they have been seen to lap water with it. Serpents cannot be said to have any true pharynx; for the nostrils, as well as the glottis, open in the mouth, and the œsophagus commences immediately after the termination of the jaws; and is capable of great extension, so as to be capable of receiving prey of a very large diameter entire. The stomach is a continuation of the œsophagus, and the intestines are very short and with but little flexure. The vent or cloaca opens by a transverse slit towards the end of the abdomen, above the origin of the tail, which is often very long. The liver consists of only one lobe of an elongated form, placed on the right, or in the mesial region, in front of the long œsophagus, and accompanies the stomach, furnishing distinct hepatic and cystic canals. The bile is greenish or brown, and the cystic canal comes direct from the liver. The spleen is not large, and is situated on the right near the insertion of the *ductus choledochus*. The *pancreas* is situated immediately under the junction of the intestine with the stomachal sac beneath the peritoneum.

The absorbent powers of the intestines of serpents are great. MM. Duméril and Bibron advert to the state of their dejections as a proof of this. They offer, to use their expression, the dry extract of the animal entire, of which only the parts that could not be liquefied remain unaltered, and absolutely in the same situation that they occupied in the carcass of the animal before it had passed through the whole length of the digestive tube. If, for instance, a rat has undergone this process, one may recognise in the dry and shapeless mass the place occupied by the muzzle of the animal, the long whiskers of its cheeks, the down which covered the delicate cartilages of its ears, the hairs of various lengths and colours which correspond with those of the back, the belly, and, above all, the tail; and, finally, even the claws, which remain in their pristine state of integrity. All that was flesh or soft matter in the body has been completely absorbed; the earthy salt, nevertheless, which gave, by means of its union with the gelatine, consistence to the bones, still indicates by its presence, and especially by its colour, the place they occupied. Dissolution, compression, and absorption have done their work upon this desiccated mass, which still however contains the elements of nourishment for the larvæ of the insects of the family *Dermestidæ*.

In the fæces of the Python which lately devoured its companion in the garden of the Zoological Society of London, there were entire scales of the digested serpent.

No. 508, *Mus. Coll. Reg. Chir.* (*Physiological series*) exhibits the stomach of a water-snake (*Pelamys bicolor*, Daud., *Anguis platurus*, Linn.) laid open to show its internal longitudinal rugæ and the gradual contraction of the pylorus. The gall-bladder, pancreas, and part of the small intestine are also preserved. 508 A, the œsophagus and intestine of a PYTHON, is noticed in that article. A portion of the intestinal canal of *Python Tigris*, showing the elongated pointed *cæcum*, the orifice by which the cæcum communicates with the ileum, and the plaited valvular production at the lower part of that orifice, is preserved in the same museum (No. 671 A). The anterior part of the liver of a rattlesnake (*Crotalus horridus*) (No. 802) shows the termination of the vena portæ and vena hepatica: the former is seen on one side of the liver, of small size, having expended itself in deep-seated branches destined to supply the materials for the biliary secretion; the latter is seen on the opposite side of the liver, of large size, increasing by the reception of superficial branches, which bring back the blood not immediately required for the function or nutrition of the viscus. No. 802 A is the entire liver of a *Python* injected, showing more distinctly than the preceding specimen the characters peculiar to the two systems of veins, the arterial structure of the coats of the vena portæ, and the granular texture and general form of the liver. No. 812 D is the pyloric end of the stomach and commencement of the intestinal canal, together with the extremity of the liver, hepatic duct, gall-bladder, and cystic ducts, pancreas, and spleen of *Boa Scytale*. Professor Owen, who made this preparation, observes that in the Ophidian reptiles the gall-bladder is situated at a distance from the liver, in close connexion with the duodenum. This preparation shows the consequent length of the hepatic duct. The cystic duct is seen to be single at its commencement, and afterwards to divide into numerous branches, which, together with the hepatic duct, penetrate the pancreas in their course to the intestine. (*Catalogue*, vol. i.)

Circulation and Respiration.—There is no great difference between the heart of serpents and that of Saurians. In *Mus. Coll. Reg. Chir.* (No. 917 B), the heart of a *Python Tigris* is prepared to show the internal structure as well as the outward form. Professor Owen, who made this preparation, observes that the blood of the general system is collected into a large elongated sinus, formed by the union of the inferior with the right superior cava. The left superior cava winds round the back of the left auricle, receives the coronary veins, and terminates in the lower part of the orifice, which leads from the above sinus to the right auricle. This orifice is protected by two semilunar valves. The whole of the inner surface of the auricle, with the exception of these valves and the opposite valve of the foramen ovale, is reticulated with delicate muscular fasciculi. The left auricle receives the blood from a single pulmonary vein, and has a similar reticulated muscular structure: there is no valve at the termination of the vein in this auricle. The blood enters the posterior or aortic division of the ventricle by two crescentic apertures, which are each provided with a single semilunar valve, extended from each side of the septum of the auricular orifices. The irregular form and small size of the aortic chamber is displayed by the removal of the posterior parietes of the ventricle. On the opposite side the pulmonary chamber is exposed; and the Professor remarks in continuation, that it is of a larger size, of a more regular oval form, and with a smoother surface. The fleshy septum, extending from the base of the ventricle to the space between the roots of the pulmonary and systemic arteries, is incomplete at its upper and anterior part, and there leaves a communication between the pulmonary and aortic chambers: these also, he remarks, intercommunicate by several round apertures of different sizes near the apex of the ventricle, which serve to thoroughly blend together the two kinds of blood before they are expelled thus mixed along the three arteries which separately arise from the ventricles. In this preparation the origins of the pulmonary artery and left aorta only are shown, and they are each provided with a pair of semilunar valves. The carotid arteries are given off from the right aorta, which afterwards unites with the left aorta at some distance below the heart. The gland analagous to the thymus gland is also preserved: its structure is cellular. White bristles are passed through the systemic veins, sinus, and auricle; and a black one through the pulmonic vein and auricle. The two branches of the pulmonary artery which go to the two separated lungs are distinguished by black bristles, which also indicate the situations of the two ductus arteriosi. (*Catalogue*, vol. ii.)

The mode of respiration in the serpents is thus:—the glottis, which has two lips, and represents a very simple larynx, opens in the mouth behind the sheath of the tongue; by means of the muscles of the os hyoïdes, which push it, it is raised so as to be presented in a dilated state behind the back nostrils. The vacuum caused by the action of the ribs in the belly tends to dilate the lung, which, through the medium of the trachea, immediately admits the air which is introduced during an inspiration: this is slow, continuing for some seconds. This air, when it has performed its office, and has been deprived of its oxygen, is expelled in the same manner, but by an inverse mechanism, which is entirely due to the action of the muscles which tend to approximate the ribs to each other. When it is expelled rather briskly, a sort of vibration or hissing is heard. The respiration being voluntarily accelerated or retarded, the chemical and vital actions which result from it must be naturally excited or abated by that cause. (Dum. and Bibr.)

In *Mus. Coll. Reg. Chir.*, No. 1088, is the anterior part of a snake (*Coluber Natrix*) with the ventral parietes removed to show the single lung *in situ*. It is a simple elongated sac, with the parietes, composing its anterior fourth, highly vascular and spongy, for effecting the respiratory change in the blood; but gradually assuming a thin membranous and slightly vascular structure, to serve as a reservoir of air. No. 1089 is a longitudinal section of the lung of a water-serpent (*Pelamys bicolor*, Daud.), showing the continuation of the tracheal canal along the lung, for the passage of air to the lower or posterior part of the respiratory cavity. No. 1090 is a similar section from the lower part of the lung of the same snake. No. 1091 is a longitudinal section of the lung of a rattle-snake (*Crotalus horridus*), showing the delicate reticulation of its internal surface, and the termination of the tracheal canal, which is continued down the ventral side of the lung. A longitudinal section of the respiratory portion of the lung of a *Pseudo-boa* (Oppel) is prepared in No. 1092, showing its reticular structure, and the gradual diminution of the thickness and vascularity of the parietes as it recedes from the trachea, which here terminates at once at the commencement of the lung. No. 1093 is a portion of the lung of the same serpent, minutely injected, and affording a beautiful example of the honeycomb structure of the parietes of the respiratory sac. No 1093 A is noticed in the article PYTHON.

As annexed to the faculty of respiration, it will be expected that something should be said relative to the voice of serpents, whose *hissing* has become proverbial. MM. Duméril and Bibron state that they hardly think that these reptiles can, as has been said of some colubers, produce hissings (sifflemens) or piercing sounds (sons bien aigus); for although their lungs have great capacity, and can furnish air for a long time, MM. Duméril and Bibron state that they could never hear more than a sort of blowing (soufflement) such as would result from the rapid issue of a current of air through a simple pipe—that of a quill for instance. White, however, who was a very good observer, in speaking of the faculty which snakes have of 'stinking *se defendendo*,' remarks, in his 'Selborne,' that he knew a gentleman who kept a tame snake, which was in its person as sweet as any animal, while in good humour and unalarmed; but as soon as a stranger or a dog or cat came in, *it fell to hissing*, and filled the room with such nauseous effluvia as rendered it hardly supportable. These offensive emanations came, no doubt, from the fetid anal glands, which seem, as White observes, to be given to certain serpents as a defence. We, at one time, narrowly watched the habits of serpents, pythons in particular, and have seen them excited in various ways; but we never remember to have heard them hiss, in the popular acceptation of the term.

Urinary System.—The serpents have no urinary bladder. In *Mus. Coll. Reg. Chir.*, the preparation numbered 1181 is the posterior part of a *Coluber*, with the ventral parietes of the abdomen removed to show the kidneys *in situ*: they are elongated lobulated glands, and the left is situated about one-fourth its length nearer the anus than the right. For the form in which the urine is voided, and the analysis of it, see BOA, vol. v., p. 23, note.

Generative System.—Serpents are oviparous, and ovoviviparous. [REPTILES, vol. xix., p. 404.] The prolific fluid is discharged directly from the cloaca of the male into that of the female, and the conjunction of the two individuals is facilitated and maintained by means of the two erectile appendages which come out of the lateral parts of the cloaca of the male, and are beset with spines or small rough hooks, destined to be retained in the corresponding parts of the female. In *Mus. Coll. Reg. Chir.*, No. 2417, is a preparation of the posterior part of the body of a snake (*Coluber Natrix*, Linn.) with the ventral integuments dissected off from the abdomen and tail, to show the testes and two intromittent organs *in situ*. The testes are small slightly compressed oblong bodies, situated anterior to the kidneys, the right about an inch in advance of the left, corresponding to the difference in the relative position of the kidneys: the intromittent organs, which consist almost wholly of a preputium, or invertible sheath, and a small glans, are retracted within their subcaudal cells; bristles are inserted into the outlets of these receptacles, and pass into the cavities of the inverted preputia. The muscles which retract the penes and invert the sheaths, are exposed, as they pass backwards to their origins from the inferior spines of the caudal vertebræ. No. 2418 is the termination of the abdomen and the tail of a large coluber, in which the left preputial sheath is laid open, showing the intromittent organ in the retracted state; and the right preputium everted, the glans protruded, and the long retractor muscle dissected. The urethral groove and retroverted papillæ on the preputial membrane and glans may be noticed in both the penes. The termination of the rectum in the cloaca, and its vascular lining membrane, are displayed by injection: below the rectum are shown the terminal orifices of the ureters, into which bristles are inserted. In No. 2419, the whole thoracic abdominal cavity of a rattle-snake (*Crotalus horridus*) is laid open, and the viscera are exposed *in situ*. The testes present a more elongated form, and are situated nearer to the anterior extremities of the kidneys than in the *natrix;* but the chief difference in respect to the generative apparatus is manifested in the structure of the intromittent organs: these appear to be double on each side, from the great development of the bifurcations of the glans penis; those of the right side are here protruded; the left bifurcate penis is retracted, the preputium inverted, and its retractor muscle displayed *in situ*. No. 2420 is a coluber (*Elaphis quadrilineatus*, Bonap.), with the two penes everted and protruded, showing the urethral grooves, the large retroverted papillæ on the preputial vascular membrane which constitutes the body of the penis, and the small flattened wrinkled processes which beset the glans. No. 2421 is another coluber (*Periops Hippocratis*, Bonap.), with the penes inverted; bristles are placed in the outlets of the preputial sheaths.

We have above stated that the true serpents have no urinary bladder. No. 2422, in the same museum, is a slow-worm or blind-worm (*Anguis fragilis*), with the ventral parietes of the abdomen dissected off, and the viscera displayed *in situ*. The testes are situated a little anterior to the dilated rectum, the right in advance of the left; their peritoneal capsules, which are somewhat collapsed, present a brownish tinge. The small allantoïd bladder which distinguishes the *Angues* from the true *Serpentes* is here preserved; the right penis is retracted, the left protruded; the retractor muscles of both are displayed.

No. 2707 of the same collection is part of the body of a Viper (*Vipera Berus*, var. *nigra*, Daud.), with the ventral parietes of the abdomen removed, and the female organs of generation, the gall-bladder, intestine, and kidneys exposed *in situ*. The right ovarium commences immediately behind the gall-bladder; it consists of an elongated thin membranous sac, containing about twenty visible elliptical ovisacs in different stages of development, and arranged in a single longitudinal series. The left ovarium commences opposite the termination of the right; the anterior extremity of each oviduct is opposite the middle of its corresponding ovary; the commencement of the tube is disposed in a few wavy folds; the rest is continued straight to the cloaca, in the anterior part of the interspace between the intestine and kidneys; the latter may be distinguished by their regularly lobulated structure; like the ovaries, they are situated unequally, the right being placed more forwards than the left. No. 2708 is a similar preparation from a coluber in which the ova in the ovaria are in an advanced state of development; the ovisac nearest the expanded anterior orifice of the left oviduct is near the period of discharging its contained ovum, and the longitudinal line is discernible which indicates the place of the future rent by which it would have escaped. The cloaca is laid open; a bristle is placed in the termination of the rectum, behind which may be observed the semilunar fissure in which the oviducts terminate, and the bilobed prominence on which the ureters open. No. 2709 shows the urinary and female organs of a Rattle-snake (*Crotalus horridus*). The ovaria, like most of the other viscera of the serpent tribe, are characterised by their great length; and the ovisacs are for the most part developed in a simple or longitudinal series. The ovaria are connected with the beginning of the oviducts by a broad duplicature of peritoneum. Each oviduct commences by a wide fissure with entire margins; its tunics, at first delicate and semi-transparent, increase in thickness as the tube contracts; the course of the oviduct is at first slightly wavy for a short extent, and is then straight, and its terminal portion is suddenly dilated. The internal membrane of the oviduct, prior to this dilatation, is disposed in minute parallel longitudinal rugæ. The termination of the rectum is seen anterior to that of the oviducts: the ureters communicate with the cloaca behind them; a bristle is passed through one of these tubes. No. 2710 exhibits the cloaca and terminations of the rectum, oviducts, and ureters, with the two anal pouches of a large species of coluber. The rectum is laid open, showing the transverse valvular fold which separates its termination from that of the oviducts; bristles are inserted into each of these, and also into the ureters, which terminate in the prominence behind the vulval fossa. No. 2711 is the cloaca of a water-snake (*Pelamys bicolor*), with the terminations of the rectum, ureters, and oviducts. The following quotation from the Hunterian MSS. is appended to the description of the preparation:—'The water-snake has two oviducts, two ovaria, two kidneys, which are placed near the lower part of the abdomen, with ureters about two inches long. The form of the anus is different from either that of the Lizard or the Newt, but it seems to be a mixture of both. It terminates in two lips like the Newts, but which are in a deep sulcus, having a semicircular edge opposing them. If this had the broad thin scale covering the whole, it would be somewhat similar to the Lizard or Snake.' (*Catalogue*, vol. iv.)

The males and females during coition are intertwined with each other, bearing a near resemblance, as MM. Duméril and Bibron observe, to their representation in the caduceus of Mercury.

The shell of the egg in the oviparous serpents, although cretaceous, is soft, like the eggs of the common hen, when she has not enough calcareous matter in her aliments, called soft eggs. They are often more than thirty in number, and are connected by a sort of viscous matter which coagulates and joins them in a kind of chain, as is well known to those who have found the eggs of our British common snake in dunghills. Their colour is ordinarily yellowish or greyish white. The yolk or vitellus is absorbed by the embryo; and an abdominal cicatrice indicates the umbilicus in the young.

Brain, Nervous System, and Senses.—The cranium of the Serpents is small in proportion to the other parts, elongated, and narrow; the internal cavity is small. The surface of the brain is nearly smooth and without sinuosities or circumvolutions. The lobes are distinct, and the whole mass is elongated. The mass of the spinal marrow, compared with the brain, is much more voluminous than the latter. The anterior lobes are rather slender, and the nerves destined for the sense of smelling are elongated, and, as it were, pediculated.

Touch.—This sense can hardly exist in a high state of development among the reptiles of this order; though there is, no doubt, a sufficient degree of it to regulate the progression of the animal, and to indicate to the constricting serpents and those which live in trees the nature of the surfaces with which their bodies are brought into contact.

Taste.—The tongue in serpents is nearly always cylindrical, deeply bifid at its free extremity, and very narrow. It can be protruded from the mouth, and rapidly vibrated in all directions, and is always moist. The sheath into which it is received can be elongated or contracted. As an organ of taste it cannot be very susceptible. The prey is swallowed entire, and under circumstances which give little or no opportunity for the gustatory exercise of the tongue. The lower-jaw, tongue, and larynx of a snake are preserved in *Mus. Coll. Reg. Chir.*, No. 1459.

Smell.—The evidence derived from the structure of this organ, and from their habits, does not justify the conclusion that the sense of smelling is very acute in serpents.

Hearing.—In the serpents there is no external auditory meatus, nor any appearance of a tympanum; but there is a guttural canal which leads from the pharynx to the tympanic cavity, and there may be observed a single ossiculum auditûs, which is elongated and widened at its two ends. In other respects the internal ear is organised like that of the Saurians. Such a structure does not indicate the enjoyment of a very acute sense of hearing, and the 'deaf adder' is become almost proverbial; but that serpents have a perception of sounds, sufficient at least to warn them of the approach of their enemies or their prey, and something more, may be concluded from the attention that many of them pay to musical sounds. [Naia, vol. xvi., p. 61.]

Sight.—The eyes of the serpent are generally very small, and there is a remarkable peculiarity in the disposition of those organs, for the transparent cornea apparently forms part of the skin and epidermis with which it is detached at each moult. There is no appearance of a tunica conjunctiva; but on dissection it has been found behind the cornea, and occupies the place of eyelids; the sac which this mucous membrane forms receives the tears, and conducts them into the nostrils. There being no eyelid, the eye of the serpent always appears to be fixed and on the watch. The sac above mentioned permits the globe of the eye however to be moved under the anterior part or epidermic cornea. Some serpents, *Trigonocephali* and *Crotali* for instance, have above the eye external cavities, which have been considered as lachrymatory sinuses, like those of the Ruminants: their only analogy however appears to be that of locality, for they receive no tears, and their cavity is always dry. Vision, excepting for some time previous to the change of skin or moult, when it is evidently less perfect, seems to be sufficiently acute in this order.

Progression.—Serpents can creep, glide, grasp, suspend themselves, erect themselves, leap, dart, bound, swim, and dive. Their creeping is a laterally sinuous motion; but their structure forbids their progression by vertical undulations, as they are often represented in the older books of natural history, and frequently on the stages of theatres. Such are the figures of the Basilisk or Cockatrice, and the *Draco apteros* in Aldrovandus and Jonston. Their multitudinous vertebræ and ribs, and the prodigious force of their innumerable muscles, compensate for their want of limbs. All the vertebræ are, so to speak, of the same form from the articulation of the head to the coccyx; and are so connected, both with the ribs and with each other, as to ensure the greatest possible quantity of progressive and constrictive power.* [Boa, vol. v., pp. 20, 21, 22.]

Geographical Distribution.—Cold latitudes do not agree with the true serpents; it is in warm climates that their numbers, their venom, and their volume attain their maximum.

Systematic Arrangement.

The general arrangement of this order will be found under the article Reptiles. We shall here confine ourselves to the more particular details given by modern zoologists.

According to Baron Cuvier, the Ophidians consist of the genus *Anguis* (slow-worms), the *True Serpents*, and the *Naked Serpents*.

Of the *True Serpents* the first division comprises the *Doubles Marcheurs* (*Amphisbæna* and *Typhlops*). The second division, the Serpents properly so called.

The Serpents properly so called are separated into the *non-venomous* and *venomous*.

Under the *non venomous* are arranged the following genera:—*Tortrix*; *Boa*, with the subgenera *Scytale*, Mer., *Erix*, and *Erpeton*; *Coluber*, with the subgenera *Python*, *Cerberus*, *Xenopeltis*, *Heterodon*, *Hurria*, *Dipsas*, *Dendrophis*, *Dryinus*, *Dryophis*, *Oligodon*; *Acrochordus*.

The *venomous Serpents* are subdivided—1st, into those with simple fangs; 2nd, those with fangs accompanied by other teeth.

1st. Simple fangs. *Crotalus*, with the subgenus *Trigonocephalus*; *Vipera*, with the subgenera *Naia*, *Elaps*, *Micrura*, *Platura*, *Trimeresura*, *Oplocephalus*, *Acanthophis*, *Echis*, and *Langaha*.

2nd. Fangs accompanied by other teeth. *Bungarus*; *Hydrus*, with the subgenera *Hydrophis*, *Pelamys*, and *Chersydrus*.

The *Naked Serpents* consist of the genus *Cæcilia*.

The *Cæciliæ*, says Cuvier, are so called because their extremely small eyes are nearly hidden under the skin, and sometimes are wanting altogether. Their skin is smooth, viscous, and furrowed with folds or annular wrinkles. It is naked in appearance only; for on dissection scales are found in its thickness, which are entirely formed, although delicate, and disposed regularly in many transverse rows between the wrinkles of the skin. Their head is depressed, their anus round, and nearly at the end of the body. Their ribs are much too short to embrace the trunk. The articulation of the body of their vertebræ is effected by facets in the form of hollow cones filled with a gelatinous cartilage, as in the fishes, and as in some of the last Batrachians, and their cranium is united to the first vertebra by two tubercles, as in the Batrachians. The maxillary bones cover the orbit, which is only pierced in the form of a very small hole, and the bones of the temples cover the temporal fossa, so that the head presents above a continuous osseous buckler. Their os hyoïdes, composed of three pairs of arches, lead to the belief that, in early youth, they have supported branchiæ. Their maxillary and palatine teeth are arranged in two concentric lines, as in *Proteus*, but are often sharp and curved backwards, as in the serpents properly so called. Their nostrils open at the back of the palate, and their lower jaw has no moveable pedicle, whilst the tympanic bone is enclosed with the other bones in the cranium.

The auricle of their heart is not divided sufficiently deeply to be regarded as double; but their second lung is as small as it is in the other serpents. Their liver is divided into a great number of transverse foliations; vegetable matters, earth, and sand are found in their stomach and intestines. The only ossiculum auditûs is a small plate on the fenestra ovalis, as in the salamanders.

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* In the article Boa (p. 25), the danger to which the keepers of constricting serpents expose themselves by holding the prey towards the snake is alluded to. Whilst we are writing this, an account of the perilous situation in which a keeper at the Surrey Zoological Gardens was placed by this dangerous habit is just come under our notice.

Some have the muzzle obtuse, the skin loose, the folds very strongly marked, and two small cilia (*cils*) near the nostrils. (*Règne Animal.*)

The *Cæciliadæ* appear to be intermediate between the *Ophidians* and *Batrachians;* hence the expressive name, *Batrachophidii*, to which order this family is referred by the Prince of Canino. [SIPHONOPS.]

Mr. Swainson makes the *Ophides* consist of the following families and genera:—

1. Hydrophidæ. (Sw.) *Water-Snakes.*

Genera. *Hydrus*, *Pelamys*, *Chersydrus*, *Acrochordus*, *Herpeton*, and *Pseudo-Boa.*

2. Crotalidæ. *Poisonous Snakes.*

Genera. *Crotalus*, with subgenus *Caudisona.* *Tisiphone*, with subgenus *Craspedocephalus.* *Cophias*, with subgenus *Trigonocephalus.* *Cerastes*, with the subgenera *Cerastes*, *Berus*, *Echis*, and *Acanthophis.* *Naia*, with the subgenera *Naia*, *Sepedon*, and *Elaps.* *Platurus*, with the subgenera *Trimesurus* (Trimeresurus?) and *Oplocephalus.*

3. Coluberidæ.

Genera. *Coluber*, with the subgenera *Coluber* and *Heterodon.* *Spiletes.* *Xenodon*, with the subgenus *Oligodon.* *Erpetodryas.* *Hurria.* *Liophis*, with the subgenera *Calamaria*, *Brachyorrhos*, *Lycodon*, *Xenopeltis*, *Scytale*, *Dryinus*, *Passerita*, and *Leptophis.* *Amblicephalus.* *Dipsas*, with the subgenus *Cerebus* (Cerberus?). *Boa*, with the subgenera *Boa* and *Eunectes.* *Python*, with the subgenera *Cenchrus*, *Python*, *Gongylophis*, and *Erix.*

The fourth family consists of the Anguidæ, or *Slowworms*, and the fifth of the Amphisbænidæ, or *Blindworms.*

The Prince of Canino places the *Ophiosauridæ*, *Anguidæ*, and *Typhlopidæ* under his fifth order of Reptiles, *Saurii.*

His sixth order, *Ophidii*, consists of the following families and subfamilies:—*Erycidæ*, with the subfamilies *Erycina* and *Calamarina.* *Boïdæ*, with the subfamilies *Boïna* and *Pythonina.* *Acrochordidæ*, with the subfamily *Acrochordina.* *Colubridæ*, with the subfamilies *Colubrina*, *Dipsadina*, *Dendrophilina*, *Natricina.* *Hydridæ*, with the subfamily *Hydrina.* *Naiidæ*, with the subfamilies *Bungarina* and *Naiina.* *Viperidæ*, with the subfamilies *Crotalina* and *Viperina.*

In his seventh order, the *Saurophidii*, the Prince places the *Chirotidæ*, with the subfamily *Chirotina;* and the *Amphisbænidæ*, with the subfamilies *Amphisbænina* and *Trogonophina;* and in his second subclass (*Dipnoa*), sec. 4th (*Batrachia*), order 8th (*Batrachophidii*), he places the family *Cæciliadæ*, with its subfamily *Cæcilina.* (*Amphibia Europæa.*)

Mr. G. R. Gray, in his last arrangement, makes the *Ophidia* the second order of the Reptiles, and thus subdivides it:—

A. *Venenosa.*

Fam. 1. Crotalidæ.

a. Crotalus; Uropsophus; Caudisona. b. Cenchris. c. Trigonocephalus. d. Bothrops; Trimesurus?; Tropidolæmus; Atropos; Megæra (Megæra?). *e. Lachesis.*

Fam. 2. Viperidæ.

a. Cerastes; Echis. b. Daboia; Clotho. c. Sepedon. d. Pelias; Vipera. c. Acanthophis.

B. *Innocua.*

Fam. 3. Colubridæ.

a. Coronella; Lycodon; Herpetodryas; Coluber; Psammophis; Tropidonotus; Heterodon. b. Calamaria; Rhinostoma; Elaps; Bungarus; Platura. c. Naja; Hamadryas; Xenodon. d. Dendrophis; Dryophis; Llangaha; Telescopus; Bucephala. c. Dipsas.

Fam. 4. Boidæ.

a. Boa; Eunectes; Epicrates; Xiphosoma. b. Python; Liasis. c. Gongylophis; Eryx; Clothonia. d. Ilysia; Cylindrophis.

Fam. 5. Hydridæ.

a. Pelamys; Lapemis. b. Hydrus; Liopala; Aturia; Hydrophis. c. Acrochordus; Chersydrus; Erpeton; Bitia. d. Homalopsis; Helicops; Hydrops; Hypsirina.

Mr. Gray makes the *Amphisbænia* his fifth order, and arranges under it the following families:—

Fam. 1. Trogonophidæ.

Trogonophis.

Fam. 2. Chirotidæ.

Chirotes.

Fam. 3. Amphisbænidæ.

a. Amphisbæna; Anops; Blanus. b. Lepidosternon; Cephalopeltis. (*Synopsis of the Contents of the British Museum*, 1840.)

Fossil Serpents.

Professor Owen, in a paper published in the 'Transactions of the Geological Society of London' (vol. vi., 2nd series), describes some fossils found in the London clay referrible to an order of reptiles which appears to have been very sparingly represented in the Fauna of former periods of the history of the earth.

Vertebræ, observes the Professor, joined enarthrodially by a deep anterior transversely oblong cup and a corresponding prominent posterior ball, and further articulated by two projecting flat oblique processes, wedged like the carpenter's tenon into a mortice excavated in the anterior oblique processes of the succeeding vertebra; supporting moreover, on either side of the fore-part of the body, an oblong convexity for the moveable articulation of the rib,—belong unequivocally to a reptile of the Ophidian order.

Professor Owen then states that there is a group of about thirty vertebræ of this description, with a number of long and slender ribs having expanded concave vertebral extremities, cemented irregularly together by a mass of indurated clay, among the fossils left by John Hunter, and now in the museum of the Royal College of Surgeons; and that a portion of the spinal column of apparently the same species of serpent, measuring 18 inches in length, and including 28 vertebræ, and a smaller group of 7 vertebræ, and a few detached ones, are in the museum of Mr. Bowerbank. The whole of these specimens are from the Isle of Sheppey.

The vertebræ in each specimen are described as presenting the same conformation and nearly the same size, and as being as large as those of a *Boa Constrictor* ten feet in length. They belong, it is stated, to the ordinary dorsal or costal series, but differ from the vertebræ of both *Boa* and *Python* in their superior length, as compared with their breadth and height. The ridge continued from the lower anterior to the lower posterior processes on each side is stated to be less developed in the fossil Ophidian. The oblique processes themselves do not extend so far outwards; and the spinous process is narrower in its antero-posterior extent, but longer.

Professor Owen observes, that in the first two of the above-mentioned differences the fossil agrees with the Linnæan genus *Coluber* and its subgenera, but differs from the *Crotalus;* in the remaining points it differs from *Crotalus*, *Coluber*, *Najia*, and *Trigonocephalus.* The long and comparatively narrow spine, the outward and backward prolongation of the upper angle of the posterior oblique processes, the uniform convexity of the costal protuberance, the uneven or finely wrinkled external surface of the superior arch of the vertebra, are characters which distinguish the Ophidian vertebræ described by Professor Owen from those of any other genus of the order with which he had been able to compare them; and he therefore proposes to designate the species provisionally by the name of *Palæophis toliapicus.* The ribs, as in all land-serpents, were hollow.

In some respects, as the configuration of the under surface of the body of the vertebræ, and in the anterior tubercle upon this surface, Mr. Owen found that the fossils agreed with the *Boæ* and *Pythons* more nearly than with the *Colubers*, in which the under surface of the abdominal vertebræ are traversed by a median longitudinal ridge: and he observes that in none of the differences above noted can there be inferred any obstacle to the practice of the same arts of entrapping and modes of destroying a living and struggling prey. The largest of these Ophidiolites in Mr. Bowerbank's collection exhibits a portion of the vertebral column suddenly bent upon itself, and indicating the usual lateral flexibility of the spine.

'If,' says Professor Owen in conclusion, 'we may suppose the species to have had the same number of vertebræ as the existing Boas, it must have exceeded eleven feet in length, and such dimensions would indicate that the species was not provided with poison-fangs. Serpents of these dimensions exist, in the present day, only in warm or tropical regions, and their food is by no means restricted to animals of the cold-blooded classes. The remains of birds and Mammalia are those which are most commonly found in the alimentary canal of such as are brought to this country dead; and living birds or quadrupeds also constitute the favourite food of the Pythons and Boas of similar dimensions, which are exhibited in our menageries. If therefore there had not been obtained direct evidence of both birds and mammals in the London clay, I should have felt persuaded that they must have co-existed with serpents of such dimensions as the species of which the dorsal vertebræ are here described.' (*Description of some* Ophidiolites (Palæophis toliapicus) *from the London Clay at Sheppey, indicative of an extinct species of Serpent.*)

Professor Owen has also informed us that, since the above was written, a small *Palæophis* has been discovered in the Eocene sand underlying the red crag of Suffolk, where the remains of the fossil monkey were found, and that he has examined vertebræ of another species of *Palæophis* in the collection of Mr. Dixon at Worthing, from the Eocene (London) clay at Bracklesham, which must have belonged to a Boa like serpent upwards of 20 feet in length.

SERPI'CULA (from *serpo*, to creep, on account of the creeping habits of the species), a small African and Indian genus of plants of the natural family of Halorageæ. The genus is characterised by being monœcious. The male flowers have the calyx small, quadripartite. Petals 4. Stamens 4 to 8. Styles 4, sterile. The female flowers have the calyx-tube adnate to the ovary, limb small, quadripartite. Petals and stamens wanting. Ovary 4 celled. Ovules and styles 4. Nuts brittle, 1-celled, 1-seeded. The species form herbaceous creeping branched plants, with axillary flowers, the males being pedicellate, and the female aggregated and almost sessile, though they are but little known. The plants of this genus are not possessed of any remarkable properties, but they must not be confounded with the Serpicula now Hydrilla verticillata of Roxburgh, which belongs to the natural family of Hydrocharideæ, and which is used in India in refining sugar, in the same way that clay is employed in other countries. A layer of the plant being spread upon the surface of the sugar, water is allowed slowly to percolate through the mass.

SERPUCHOW. [Moscow.]

SE'RPULA. [Tubicolidæ.]

SERPU'LIDÆ. [Tubicolidæ.]

SERRA'NUS, a genus of fishes nearly allied to the perches, but readily distinguished by their possessing only one dorsal fin and seven branchiostegous rays. The preoperculum is dentate, and the operculum has one or more angular projections.

This genus contains many species, and these appear to be most numerous in the seas of temperate or warm climates.

Cuvier restricts the term *Serranus* to those species which have no apparent scales on either of the jaws. Of this section two species are found off the British coast (*Serranus cabrilla*, Cuv. and Val.; and *S. Couchii*, Yarrell), and the Mediterranean yields several.

Those species of the great genus Serranus in which both jaws and the muzzle are provided with scales, have the subgeneric title *Anthias*. A very beautiful species of this section is found in the Mediterranean, the *Anthias sacer*; it is of a brilliant red colour, and has yellow bands on the sides of the head. The third dorsal ray is much elongated; the ventral fins are long, and the lobes of the tail-fin are produced into long filaments.

Another section of the Serrani is termed *Merra* by Cuvier. The species of this section have no scales on the upper jaw, but the lower jaw is provided with small scales. The *Merra gigas*, an inhabitant of the Mediterranean (which has been found on the British coast), is about three feet in length, and of a brown colour clouded with deep-brown. Many of the species are dotted with various colours; some are longitudinally and others transversely striped.

SERRAVALLE. [Novi.]

SERTO'RIUS, QUINTUS, was a native of Nursia, in the country of the Sabines. He lost his father very early, but his mother bestowed great care upon his education, and the son in return for her kindness entertained for her through life the most tender affection. After his education was completed, he tried his fortune at Rome as an orator, and thereby acquired considerable influence. (Plut., *Sert.*, 2; Cic., *Brut.*, 48.) But he soon turned his attention to military affairs, and the first time that he distinguished himself was during the campaign of Marius against the Cimbri and Teutones. At the end of this campaign he was sent to Spain as tribune under the praetor Didius, and spent the winter in the Celtiberian town of Castalo. Here again he attracted much attention by his courage and prudence. After his return to Rome, when the Marsic war was breaking out, he was made quaestor of Gallia Circumpadana and commissioned to levy troops, which he (Plut., *Sert.*, 4) accomplished with the greatest success, but his exertions caused him the loss of one of his eyes. (Plut. and Sallust., *ap. Gell.*, ii. 27.) On his return to Rome he was a candidate for the tribuneship of the people, but was defeated by the party of Sulla. Sertorius now joined the party of Cinna and Marius, not because he approved of their proceedings, but because he detested the ruling aristocrats. After the Marian party was defeated and Marius himself driven from Italy, Cinna and Sertorius raised fresh troops in Italy and held out against their opponents. When Marius returned from Africa (87 B.C.) and took bloody vengeance upon his enemies, Sertorius was the only one of the party who showed moderation: how much he was in earnest in this matter is evident from the fact that after the death of Marius he put to death 4000 slaves who had been the body-guard of Marius and had perpetrated every possible crime against the citizens. (Plut., *Sert.*, 5.) When Sulla returned to Italy in 83 B.C., and Sertorius saw that all would be lost, and that the consuls Scipio and Norbanus paid no regard to his advice, he contrived to be made proconsul of Spain, and went to his province, where he hoped to prepare a refuge for his friends if they should be defeated in Italy. (Plut., *Sert.*, 6; Appian, *Civil.*, i. 108.) In Spain he began his new career, in which he displayed prudence and courage tempered with humanity. Spain had hitherto, with few exceptions, been preyed upon by avaricious governors. Sertorius listened to the just complaints of the natives, and attempted to blend them with the Romans as much as possible. The great among the Spaniards were gained by his affability, and the poor by his reduction of taxes. At the same time he carried on his preparations for the approaching war with the utmost energy, and kept both Romans and Spaniards in constant exercise. When he heard that Sulla was in possession of Rome, and that his own party was defeated, he sent Julius Salinator with 6000 heavy-armed troops to take possession of the passes in the Pyrenees. About the same time C. Annius, a Sullanian general, arrived at the Pyrenees, but tried in vain to effect a passage. Salinator was treacherously slain and his army dispersed, and Annius now crossed the Pyrenees. Sertorius, who was too much weakened by this event to offer any resistance, retreated to New Carthage, and, accompanied by a few faithful followers, he cruised for a time in the Mediterranean. He made a landing in Africa, where he aided one of the native princes, and defeated Paccianus, one of the generals of Sulla. After having had an encounter with a large fleet of Annius, and after having escaped from a very heavy storm, he again landed in Spain near the mouth of the river Baetis. Here he heard an account of the delightful climate of the Insulae Fortunatae (the Canary Islands), and was greatly inclined to withdraw thither and to spend the remainder of his life in quiet. (Plut., *Sert.*, 8, 9.) His men however involved him in another military undertaking in Africa, and his great success induced the Lusitanians, who were oppressed by cruel and rapacious governors of the Sullanian party, to invite Sertorius to the supreme command among them. This invitation came just at the moment when he was considering whither he should retire. (Plut., *Sert.*, 10.) Sulla was now dead, and Sertorius, being at such a distance from Rome and little acquainted with the real state of affairs there, conceived new hopes of ultimate success, and gladly accepted the invitation. On his appearance in Lusitania, the Romans as well as the Spaniards immediately declared for him. He now began to make war upon four Roman generals who were in possession of the greater part of Spain, and had great armies at their command. Sertorius defeated Cotta near Mellaria in a sea-fight, and Aufidius in Baetica, while his legate conquered Domitius and L. Manlius. Thoranius, a legate of Metellus, was likewise defeated. About the time Sertorius was joined by Perperna with the numerous remains of the Marian party, and Metellus Pius, who had the command in Baetica, was gradually driven to such extremities [Metellus], that L. Lollius came to his assistance from Gaul, and the senate at Rome thought it necessary to send Pompey with a large force to support Metellus. [Pompeius, p. 382.]

As soon as Sertorius had firmly established himself in Spain, he formed the design of uniting the Romans and Spaniards in such a manner that the Spaniards should have all the advantages of Roman civilization without losing their national character. At Osca, the modern Huesca in Catalonia, he established a kind of academy, into which he received the sons of distinguished Spaniards, and had them instructed in Greek and Roman literature. The admirable discipline of this establishment, the manner in which the youths were dressed, for he gave them the Roman *bulla* and the *prætexta* (which only the sons of noble Romans used to wear), the prizes which were distributed among them, and the promise that these young men should one day be Roman citizens and be invested with high honours—all these things were in the highest degree flattering to the parents of the youths, and could not fail to gain for Sertorius the affections of the nation. It was a custom of the young warriors among the Spaniards to gather around a favourite general, to accompany him everywhere, and to vow not to survive him. The number of men who became in this manner attached to Sertorius was greater than had ever been known before. (Plut., *Sert.*, 14.) Sertorius also worked upon the imagination of the Spaniards: he had a tame white fawn which accompanied him everywhere, and which he said was the gift of Diana. The Spaniards thus looked up to him almost as a being of a higher order, who had intercourse with the gods. It may be that this was, as Plutarch thinks, a piece of imposition upon the credulous Spaniards, but we have no reason to suppose that Sertorius himself did not share the belief of the Spaniards on this subject. (Comp. *Gellius*, xv. 22.) His object was to establish an independent power, or to raise a new Roman republic in Spain. For this purpose he formed a senate of 300 members, consisting partly of exiled Romans, and partly of distinguished Spaniards (Appian. *Civ.*, i. 108; Plut., *Sert.*, 22), and also appointed several officers analogous to those of Rome. Sertorius was with the Romans and Spaniards the object of love and admiration. Perperna had observed this state of things, ever since his arrival in Spain, with secret jealousy and envy. He would have liked to carry on the war against Metellus in his own name; but when the news came that Pompey was advancing, his own soldiers compelled him to join Sertorius, and to submit to him.

On the arrival of Pompey in Spain, many towns declared for him, and among others Lauron, though it was at the time besieged by Sertorius. Pompey hastened to its assistance, but could do nothing, and was obliged to look on while Sertorius razed the town to the ground. (Plut., *Sert.*, 18; Appian, *Civil.*, i. 109.) The first great battle with Pompey was near Sucro. Metellus here defeated that part of the army which was commanded by Perperna, and put him to flight; but Sertorius, who commanded another division of the army, wounded Pompey, and compelled him to retreat. A second battle was fought in the plains of Saguntum, in which Pompey was again defeated, and compelled to withdraw to the Pyrenees. It was in the summer of the year 74 B.C. that Mithridates sent ambassadors to Sertorius, to propose an alliance, and to offer money and ships, on condition that all the countries of Asia which he had been obliged to surrender should be restored to him. Sertorius concluded the alliance, and encouraged the king again to take up arms against Rome, but he scrupulously avoided doing his own country more harm than his own safety required. (Plut., *Sert.*, 23; Appian, *De Bell. Mithrid.*, 68.) This alliance, owing to the events which followed it, had few or no results.

Pompey, in the meanwhile, was reinforced by two legions from Italy; and he and Metellus again advanced from the Pyrenees towards the Iberus. In this campaign, though many of the soldiers of Sertorius began to desert, no great advantages were gained by Pompey or Metellus, and the former was no more successful in the siege of Pallantia, than both together in that of Calaguris. Metellus, despairing of victory over Sertorius in an honourable way, offered to any Roman citizen who should kill Sertorius one hundred talents and 20,000 acres of land. If the murderer should be an exile, Metellus promised that he should be allowed to return to Rome. The whole summer of the year 73 B.C. passed without any great battle, though the Roman party seems to have gained some advantages.

The dishonourable conduct on the part of the Romans, and the increasing desertion in the army of Sertorius, as well as the manifest envy of others about his own person, produced a change in the conduct of Sertorius also: he lost his confidence in those who surrounded him, and punished severely wherever he found reason for suspicion. While he was in this state of mind, he committed one act which will ever be a stain on his otherwise blameless character: the young Spaniards assembled at Osca, who were in some measure his hostages, were one day partly put to death, and partly sold as slaves. The immediate cause of this is unknown, but the effect produced on the Spaniards may easily be conceived. In addition to all this, Perperna now found an opportunity of giving vent to his hostile feelings. He formed a conspiracy of some Romans who served under Sertorius, and in order to gain associates among the Spaniards, and provoke them still more against Sertorius, the conspirators inflicted severe punishments for slight offences, and exacted heavy taxes, pretending that they were only executing the commands of Sertorius. Desertion and insurrection among the Spaniards were the natural results. According to Appian, several of the conspirators were discovered and put to death, but Plutarch does not mention this circumstance. Perperna at last, seeing no possibility of attacking Sertorius, as he never appeared without an armed body-guard, invited him to a repast, ostensibly given on account of some victory gained by one of his lieutenants. At this repast he was treacherously murdered by the conspirators (72 B.C.), and Perperna placed himself at the head of his army. [POMPEIUS, p. 302.]

Such was the end of one of the noblest characters that appear in the pages of Roman history during the last century of the republic. The war which he had carried on in Spain was not directed against his country, but only against a party who wished to annihilate him. How little he was actuated by any hostile feeling towards the republic itself may be seen from the statement of Plutarch (*Sert.*, 22), that after every victory which Sertorius gained, he sent to Metellus and Pompey, offering to lay down his arms, if they would but allow him to return to Rome, and to live there in peace and retirement, declaring that he would rather be the obscurest person at home than a monarch in exile. As long as his mother lived, it was principally in order to comfort her old age that he wished to return to Italy; but she died a few years before her son, to his great grief. If we regard Sertorius as a general, it was surely no vulgar flattery that his contemporaries compared him with Hannibal. The details of his wars in Spain are very little known, for the account of Appian (*Civil.*, i. 108-114) is excessively meagre and incoherent; and Plutarch, in writing the life of Sertorius, had other objects in view than to present to his readers a clear description of his military operations. Appian says that the war in Spain lasted eight years, which is incorrect, whether we date the commencement of the war from the time when Sertorius left Italy in the consulship of Scipio and Norbanus (83 B.C.), or from the time that he was invited by the Lusitanians to take the command (78 B.C.).

SERTULA'RIA, a Linnæan genus of Polypiaria, now the type of the numerous family. [SERTULARIÆA and POLYPIARIA.]

SERTULA'RIDÆ, one name of a family of Polypiaria, including the genus Sertularia of Linnæus. [POLYPIARIA.]

SERTULARIÆA, De Blainville's name for the family of Polypiaria, founded on the Linnæan genus Sertularia. [POLYPIARIA.]

SERUM, the name given to the essentially liquid part of the blood, and also to the fluid secreted by certain membranes in the human body, such as the pericardium, pleura, peritoneum, &c., which are thence denominated 'Serous.' The serum of the blood, which separates from the crassamentum during the coagulation of that liquid, has a pale, straw-coloured, or greenish-yellow colour, is transparent when carefully collected, has a slightly saline taste, and is somewhat unctuous to the touch. It has a specific gravity of 1·027 to 1·030 at 50°. It usually constitutes about three-fourths of the blood, the pressed coagulum forming about one-fourth. It has a slight alkaline reaction with test-paper, slowly reddening turmeric, and rendering the blue of violets green: the readiest test of its alkalinity is litmus-paper reddened by acetic acid, to which it immediately restores the blue colour. This is owing to the presence of soda, which some chemists believe to be combined with carbonic acid, and others with albumen: the last opinion is the more probable, since serum, when agitated with carbonic acid, absorbs that gas in considerable quantity. Like other albuminous liquids, it is coagulated by heat, acids, alcohol, and all other substances which coagulate albumen. When the serum is heated to about 150°, it becomes a soft solid, coagulating into a translucent mass, which, upon the continuance of heat, becomes more opaque; and upon being subjected to gentle pressure, gives out a small quantity of a yellowish alkaline liquid, which has been termed 'serosity.' This contains, according to Dr. Bostock, about 1-50th of its weight of animal matter, together with a little chloride of sodium. Of this animal matter, a portion is albumen, which may easily be coagulated by means of galvanism; but a small quantity of some other principle is present, which differs both from albumen and gelatine. (*Med. Chir. Trans.*, ii. 166.) The composition of the serum, according to the analysis of Lecanu, may be seen from his analysis of the blood, abstracting the colouring matter and fibrin, which are foreign to it. The following table exhibits the results of two careful analyses:—

Water	780·145	785·590
Fibrin	2·100	3·565
Colouring matter	133·000	119·626
Albumen	65·090	69·415
Crystalline fatty matter	2·430	4·300
Oily matter	1·310	2·270
Extractive matter soluble in water and alcohol	1·790	1·920
Albumen combined with soda	1·265	2·010
Chloride of sodium	8·370	7·304
Chloride of potassium		
Carbonates		
Phosphates of potash and soda		
Sulphates		
Carbonates of lime and magnesia	2·100	1·414
Phosphates of lime, magnesia, and iron		
Peroxide of iron		
Loss	2·400	2·586
	1000·000	1000·000

The late Dr. Marcet found that 1000 parts of the serum of human blood are composed of—water 900 parts; albumen, 86·8; muriate of potash and soda, 6·6; muco-extractive matter, 4; carbonate of soda, 1·65; sulphate of potash, 0·35; and of earthy phosphates, 0·60. This result agrees very nearly with that obtained by Berzelius, who states that the extractive matter of Marcet is lactate of soda united with animal matter. (*Med. Chir. Trans.*, iii. 231.)

The fluid secreted by serous membranes in general, such as the pericardium, pleura, and peritoneum, is very similar to lymph. According to Dr. Bostock, 100 parts of the liquid of the pericardium consist of—water 92 parts; albumen, 5·5; mucus, 2; and chloride of sodium, 0·5. The serous fluid exhaled within the ventricles of the brain in *Hydrocephalus internus* is composed, in 1000 parts, of—water 988·3; albumen, 1·66; muriate of potash and soda, 7·09; lactate of soda and its animal matter, 2·32; soda, 0·28; and animal matter soluble only in water, with a trace of phosphates, 0·35. (Berzelius, in *Med. Chir. Trans.*, vol. iii., p. 252; Turner's *Elements of Chemistry;* and Brande's *Manual of Chemistry.*)

SERVAL. [TIGERS.]

SERVAN, ST. [MALO, ST.]

SERVANDO'NI, JEAN JE'RÔME, was born at Florence in 1695, but he may be reckoned among the artists and architects of France, as he established himself in that country, where he signalized himself by his extraordinary talents. His first instructor in painting was Panini, under whom he became an expert artist in landscape and architectural scenery, and many of his productions of that period are preserved in various collections. He afterwards applied himself to architecture under De Rossi. After passing some time at Lisbon, where he was employed as scene-painter and in getting up the performances of the Italian opera, he proceeded to Paris in 1724, and was engaged in a similar capacity. He had now opportunities of exercising his talents on the most extensive and even prodigal scale, and he not merely improved the former system of theatrical decoration, but produced an entirely new species of it, in which the scenic illusion and effect were aided by machinery, and heightened by every possible artifice. For the reason assigned elsewhere [SCENE-PAINTING] the fame of his achievements of this class is now merely traditional; but if we may believe the testimony of contemporaries, they must have been most extraordinary. Among the most celebrated of them was the representation of the fable of Pandora (at the Tuileries in 1738), and of the Descent of Æneas into the Infernal Regions. These and other scenic exhibitions, as they may properly be denominated, were received with enthusiasm by the public, nor were they least of all admired by those who were capable of appreciating the poetical invention and the profound classical study displayed by the artist. Even in his most magnificent architectural fancies Servandoni never outraged probability by exhibiting mere gorgeous chimeras, as many others have done, all his compositions of the kind being as regularly planned as if intended for execution.

As may be supposed, his talents were greatly in request upon all extraordinary public festivities, and he directed those which took place at Paris, in 1739, in honour of the marriage of Philip V. of Spain with the Princess Elizabeth. Unfortunately such triumphs are so exceedingly fugitive and ephemeral, that however much they may contribute to an artist's fame, they are attended with no benefit to art itself. It would have been more to the advantage of art, if Servandoni had been afforded the opportunity of realising some of his projects for the improvement or embellishment of various parts of the capital, including one for an extensive *place* or amphitheatre for public festivals, surrounded with arcades and galleries capable of containing twenty-five thousand persons. The chief structure executed by him is the façade which he added to the church of St. Sulpice at Paris, erected by Oppenord. Although not altogether unexceptionable, this work, begun about 1732, is greatly superior to almost every other of its kind of the same period. Unlike the frittered and unmeaning frontispieces with which it was then the custom to mask the exterior of churches, the façade of St. Sulpice possesses a certain degree of simplicity and harmony. The arrangement of the loggia formed by the Doric order below, where the columns are coupled, not in front, but one behind the other, is good, and combines lightness with solidity; but this merit is in a great measure counteracted by the intercolumns of the second order being filled in with arcades and piers, whereby that portion is rendered more solid and heavier in appearance than the one below.

Servandoni died at Paris in 1766, leaving, instead of a splendid fortune, as was expected, scarcely any property at all behind him; for though he might easily have amassed wealth, he was too great a votary of pleasure to put any restraint upon his habits of profusion, nor was economy a word admitted into his vocabulary, or even understood by him.

SERVANT, one who has contracted to serve another. The person whom he has contracted to serve is styled master. Servants are of various kinds; apprentices [APPRENTICE], menial or domestic servants who reside within the house of the master, servants in husbandry, workmen or artificers, and clerks, warehousemen, &c. From the relation of master and servant a variety of rights and duties arise. Some of these are founded on the common law, and some on special statutory enactments.

A contract of hiring and service need not be in writing unless it be for a period longer than a year, or for a year to commence at some future time. If in writing, it is not liable to any stamp duty, unless it apply to the superior classes of clerks, &c. To all such contracts the law attaches an implied undertaking on the part of the servant faithfully and carefully to serve the master, and to do his lawful and reasonable commands within the scope of the employment contracted for; on the part of the master, to protect and fairly remunerate the servant. This implied undertaking to remunerate may be rebutted by circumstances showing that it never was contemplated, as where it appears that the servant merely came on trial, or where a party has brought to England a person who was his slave abroad. In all hirings where no time of duration is expressed, except those of menial servants, it is a rule of law that the contract shall continue for a year. In the case of menial servants it is determinable by a month's warning, or the payment of a month's wages. Servants in husbandry can only be discharged or quit the service upon a quarter's notice. This rule as to time may of course also be rebutted by any circumstances in the contract inconsistent with its existence. In the case of immorality, or any kind of offence amounting to a misdemeanor committed during the time of the service, or of continued neglect, or determined disobedience, a servant may be immediately discharged. If the servant is a menial, he is nevertheless entitled to wages for the time during which he has served. But in other cases, where the contract is entire for a year, the wages cannot be apportioned, and the service having been determined before the expiration of the time contracted for, in consequence of the fault of the servant, he is not entitled to claim wages for any portion of the time during which he has served. The contract still continues to exist, notwithstanding the disability of the servant to perform his duties from illness, and he is therefore still entitled to receive his wages. The master however is not bound to pay the charges incurred by medicine or attendance upon his sick servant. In case the goods of the master are lost or broken by the carelessness of the servant, the master is not entitled to deduct their value from the wages of the servant, unless there has been a special contract between them to that effect. His only remedy is by an action at law against the servant. Where a master becomes bankrupt, the commissioners are authorised, on proof that they are due, to pay six months' wages to his clerks and servants. If the wages for any longer period are due, they must be proved for like other debts under the fiat. If a servant has left his service for a considerable time without making any demand for wages, it will be presumed that they are paid. A master may chastise his apprentice for neglect or misconduct, but he will not be justified in striking any other description of servant. Servants who steal or embezzle their master's goods are subject to a greater degree of punishment than others who commit those crimes. [LARCENY.] Masters are not compellable to give a character to servants who leave their employment. If they choose to do so, and they give one which is false, they may be liable to an action at the suit of the servant; but in order to recover in such an action, the servant must prove that the character was maliciously given for the purpose of injuring him. If the master, merely for the purpose of confidentially communicating, *bonâ fide* state what he believes to be the truth respecting a servant, he is not responsible for the consequences of his communication.

By a great variety of statutes, the provisions of which are collected and explained in Burn's *Justice*, tit. 'Servants,' a special jurisdiction is given to magistrates over servants in husbandry, and also in many classes of manufactures and other employments. None of these rules of law apply to menial servants. The object of them, as relates to servants in husbandry, is to compel persons not having any ostensible means of subsistence, to enter into service, to regulate the time and mode of their service, to punish negligence and refusal to serve, to determine disputes between masters and servants, to enable servants to recover their wages, and to authorise magistrates under certain circumstances to put an end to the service.

Those statutes which relate to servants in manufactures and other employments prohibit the payment of wages in goods, and provide for their payment in money, and for the regulation of disputes concerning them. They also contain various enactments applicable to the cases of workmen, &c. absconding, neglecting or mismanaging their work, injuring or embezzling the materials, tools, &c. entrusted to them, and fraudulently receiving those entrusted to others. With respect also to this class of servants, magistrates have authority to put an end to the contracts of hiring and service. The 6 Geo. IV., c. 129, provides for the cases of combinations among masters and workmen relative to wages, times of working, &c.; and 9 Geo. IV., c. 31, for those of conspiracies and assaults for the purpose of attaining such ends.

By reason of the relationship which exists between a master and a servant, and the protection which is thereby due from the former to the latter, a master is not held to be guilty of the offence of maintenance, though he maintain and support his servant in an action brought by him against a third party. When a servant is assaulted, his master is justified in assisting his servant, and repelling the assault by force, although he himself be not attacked; and under similar circumstances a servant may justify an assault committed in defence of his master. A master is answerable, both civilly and criminally, for those acts of his servant which are done within the scope of his employment. Thus a master is indictable if a servant commit a nuisance by throwing dirt on the highway; and a bookseller or newsvender is liable, criminally as well as civilly, for libels which are sold by his servant in his shop. This liability of the master does not release the servant from his own liability to punishment for the same offence. The servant is also liable when he commits a trespass by the command of his master. A master, although liable civilly for any injuries arising from the negligence or unskilfulness of his servant, is not responsible for the consequences of a wilful act of his servant done without the direction or assent of the master. In such case the servant alone is liable. Where a servant may be considered to be in the employment of two persons, difficulties have sometimes occurred in determining which person is responsible in the character of master for damages done to third persons by the servant. The following is an instance:—When a coachman is sent by the owner of horses let out for the purpose of drawing a private carriage, and afterwards, while driving the hirer in his private carriage, the coachman does some damage to a third party; in this case it has been held that the owner of the horses was liable; and it seems but reasonable that he who possessed the power of selecting and discharging the servant should be responsible for his acts. Where a servant makes a contract within the scope of his employment, what he does will be binding on his master, just as if he had expressly authorised the servant. But in all cases where there is no express evidence of the delegation of the master's authority, there must be facts from which such delegation can be inferred. Where a servant obtains goods for his master, which the master uses, and he afterwards gives money to the servant to pay for them, the master will be liable to pay for them, even though the money should have been embezzled by the servant. If a coachman go in his master's livery to hire horses, which his master afterwards uses, the master will be liable to pay for them, though the coachman has received a large salary for the express purpose of providing horses; unless indeed that fact were known to the party who let out the horses. If a master is in the habit of paying ready money for articles furnished to his family, and gives money to a servant, on a particular occasion, for the purpose of paying for the articles which he is sent to procure, the master will not be liable to the tradesman if the servant should embezzle the money. Where articles furnished to a certain amount have always been paid for in ready money, and a tradesman allows other articles of the same character to be delivered without payment, the master will not be liable, unless the tradesman ascertains that the articles are for the master's own use. Where a tradesman, who had not before been employed by a master, was directed by a servant to do some work, and afterwards did it without any communication with the master, it was held that the master was not liable, though the thing upon which the work was done was the property of the master.

By the contract of hiring and service the master obtains a right to the service of the servant. Any one therefore who interferes with that right does him an injury for which he is responsible in an action for damages. A master may be deprived of the services of a servant, either by some hurt done to the servant, or by his being enticed out of the service. An action therefore may be brought by a master where a servant has received some personal injury disqualifying him from the discharge of his duties as a servant, as where he has been disabled by the overturn of a coach, the bite of a third person's dog, &c. The action by a parent against the seducer of his daughter is of this class, and purports to be brought to recover the damages incurred by the parent for the loss of his daughter's services; and although in practice the damages are never really measured by the injury occurring from the mere loss of service, still from the form of the action, the only one which can be brought in such case, it is necessary to give some slight evidence of services performed. Any kind of assistance in domestic offices is sufficient. [PARENT AND CHILD]

In order to succeed in an action for enticing a servant out of his service, the master must prove that the party enticing away the servant knew of the previous engagement at the time when he enticed him away, or that he has refused to restore the servant upon subsequent application. This action is maintainable where the servant is hired to do work by the piece, as well as where the servant is hired for a definite time. But no action lies for inducing a servant to quit his service at the period when the definite time for which he was hired expires, although the servant had no previous intention of quitting the service at such period: neither will an action lie against a party for enticing away a servant, if the servant has paid to the master the penalty stipulated for by the agreement of hiring and service in case of his quitting his master's service. Where a servant has been enticed away from the service, an action lies against him for his breach of contract, as well as against the party who has enticed him away.

It is not inconsistent with the duty of the servant of a tradesman to solicit his master's customers to give him business after he shall have left the service of his master. Where a workman discovers a new invention during the time of his service, the invention is the property of the servant, unless perhaps he were especially hired for the purpose of making new inventions.

By the statute 32 Geo. III., c. 56, 'for preventing the counterfeiting the certificates of the characters of servants,' magistrates are empowered, upon information being laid before them, to inflict certain penalties and punishments upon parties who personate masters and give false characters with servants; and also upon those who, though they really have been masters, wilfully make false statements in writing, as to the time and particulars of the service or the character of the servant, and also upon those who personate servants or falsely state that they have been in particular services, or deny that they have been in such employments as they really have filled. Independently of the provisions of this statute, a person who wilfully gives a false character with a servant is liable to an action at the suit of the party who has been induced by the false character to employ the servant, for any damages which he may suffer in consequence of employing him. Thus where one was induced by a false character to employ a servant who afterwards robbed him to a large amount, and was convicted of the robbery, the master was held to be entitled to recover to the extent of his loss from the party who gave the false character.

Formerly a settlement was gained by residence in a parish under a contract of hiring and service for a year, but by the Poor Law Amendment Act no settlement can for the future be gained by such means. [POOR.] (Bl., *Com.*, book i., c. 14; Burn's *Justice*, tit. 'Servants.')

SERVE'TUS, MICHAEL (whose family name was Reves), was born at Villanueva in Aragon, in the year 1509. He was the son of a notary, who sent him while young to the university of Toulouse in order to study the law, instead of which however he appears to have devoted his attention principally to theology during the three years which he spent in that city.

In his twenty-first year he quitted Toulouse, and journeying into Italy in the suite of Quintana, confessor to the emperor Charles V., was present at the coronation of that monarch at Bologna, in February, 1530. The death of Quintana soon left him at liberty to travel into Switzerland and Germany, where he became acquainted with many of the reformers. In the course of 1530 he took up his residence at Basle, and there he first broached those opinions which afterwards drew down upon him the persecution of Calvin. He probably met with few persons who were disposed to embrace his notions, for, in the course of the same year, or early in 1531, he left Basle and went to Strasburg. His stay in Strasburg however was short, since he lived at Haguenau in Alsace during the printing of his treatise on the doctrine of the Trinity. This, his first work, was published by a bookseller of Basle in 1531, but the opinions which it contained were so contrary to those usually received, that the man feared to print it at Basle, and procured its publication at Haguenau, the name of which place appears on the title-page. In the following year Servetus wrote a second treatise, in the form of dialogues, on the same subject; in which he corrected some errors in his former work, but without retracting any of the opinions.

We are unacquainted with the exact time when Servetus quitted Haguenau, but we next find him at Lyon, where he remained three years, occupying himself principally with the study of medicine. It is probable that during this time he supported himself by correcting the press, and by other literary labours, among which was the publication of an improved edition of Pirkheimer's translation of Ptolemy's Geography, which appeared in the year 1535. On leaving Lyon he visited Paris, where he took the degree of M.A., and afterwards of doctor of medicine. He was likewise admitted a professor of the university, and delivered lectures on the mathematics. He was in Paris in 1537, in which year he published an essay on syrups, the only medical work that he wrote, but his ungovernable temper involved him in disputes with the medical faculty, which compelled him to leave the city. It is most likely that he again returned to Lyon, for in 1540 we find mention of him as practising medicine, in the immediate neighbourhood, at the village of Charlieu. His attempt to obtain practice there seems to have been unsuccessful, and taking up his abode once more in Lyon, he supported himself by correcting the press for the Frellons, the printers. He likewise superintended a new edition of the Bible, which was published in 1542, and the notes which he added afforded materials to strengthen the charge of heresy afterwards brought against him.

In the year 1543, Pierre Palmier, archbishop of Vienne in Dauphiné, meeting with Servetus at Lyon, induced him to return with him to his see. Servetus devoted himself to the practice of medicine in this place, where he remained until his trial for heresy ten years afterwards. Theology however was still a favourite pursuit with him, and for many years he carried on a controversial correspondence with Calvin, in the course of which he sent him a portion of a manuscript containing many of the opinions which subsequently appeared in his 'Christianismi Restitutio.' Their private correspondence, never very friendly, degenerated by degrees into quarrelling, and at length into scurrility; and Servetus having replied to a violent letter of Calvin concerning his own opinions, by sending a list of what he called errors and absurdities in Calvin's 'Institutes,' the latter angrily broke off all communication with him. In the same year, 1546, Calvin wrote to Farel and Viret, saying, that if ever Servetus came to Geneva, he would take care that he should not escape in safety. He is stated by Bolsec even to have denounced Servetus to Cardinal Tournon as a heretic; and the same authority adds that the cardinal laughed heartily at one heretic accusing another.

Servetus, in a letter to one of his friends, had expressed the presentiment that he should suffer death for his opinions; and he did not publish the 'Christianismi Restitutio' without taking every precaution to conceal the fact of his being the author. He had endeavoured to get the work published at Basle, but no bookseller would undertake the dangerous engagement, and he eventually had it printed at Vienne in 1553, but without his own name or that of the printer, or even the date, or name of the place.

The work caused a great sensation; but the author would have remained unknown, had not Calvin recognised in the style, and in the abuse of himself, the hand of Servetus. He immediately procured one William Trie, a citizen of Lyon, but a recent convert to the reformed religion, and then resident at Geneva, to write letters to the authorities of the former city, containing many serious imputations against Servetus, and charging him with having written the 'Christianismi Restitutio.' The archbishop of Lyon, Cardinal Tournon, whose diocese, from its proximity to Geneva, was peculiarly exposed to the influence of heresy, no sooner received this intelligence than he wrote to the governor-general of Dauphiné, acquainting him with what he had heard concerning Servetus. In consequence of the suspicion thus thrown upon him, Servetus was arrested and imprisoned, but he would in all probability have been acquitted for want of evidence against him, had not Calvin, through the medium of Trie, forwarded to the Inquisition at Vienne a portion of manuscript and several private letters which he had received from Servetus. Mr. Scott, in his 'History of Calvin and the Swiss Reformation,' London, 1833, chap. xi., endeavours to extenuate the guilt of the reformer, and denies that these letters were produced on the trial. That in this however, as in some other of his statements, Mr. Scott is mistaken, appears from the fact that in the condemnation of Servetus by the Inquisition of Vienne, 'letters and writings addressed to Mr. J. Calvin' are especially mentioned.

Servetus escaped from prison, where he had not been strictly guarded, but was burnt in effigy at Vienne, on June 17, 1553. He fled to Geneva, in which town he kept himself closely concealed, but was arrested, through Calvin's influence, on the day before that on which he was about to start for Zürich on his way to Italy. He was arrested contrary to law, the city of Geneva having no authority over him, who was merely journeying through it: when in prison, he was treated with the greatest cruelty; and he was denied the assistance of counsel. His private papers, and a volume of Calvin's 'Institutes,' in which he had made some notes with his own hand, were brought in evidence against him. Calvin's own servant, one La Fontaine, appeared as the accuser, Calvin not caring to submit to the lex talionis of Geneva, which imprisoned the accuser as well as the accused; though, in direct opposition to this law, La Fontaine was released after being only one day in prison. Servetus was brought to trial on August 14, 1553; and on that day, and on several days following, he was examined publicly before his judges. Calvin drew up the articles of accusation, in which the calumnies against himself are alleged as part of the crime of Servetus; and further he reserved to himself the office of disputant upon theological subjects with the prisoner. Many of the charges against him were frivolous and vexatious in the extreme, but it is certain that he did not anticipate so severe a sentence as was passed upon him; for when, on August 26, the vice-bailiff of Vienne, having come to Geneva, requested that Servetus might be given up to him in order to undergo the sentence passed upon him by the Inquisition, he threw himself at the feet of his judges, begging that they would rather try him, and pass on him whatever sentence they might think fit.

On September 1, Servetus was called before his judges and ordered to be ready to reply in writing to a set of written charges which Calvin was instructed to draw up. On September 15 he wrote a touching letter, complaining of the harsh treatment he had undergone, begging that his case might speedily be decided, since he had been already detained five weeks in prison, and appealing from the private hatred of Calvin to the decision of the council of two hundred. This appeal however was rejected, and Servetus was furnished with a copy of the charges against him drawn up by Calvin. To these he sent in a brief written answer, and it does not appear that after September 15 he defended himself in open court, where he was much inferior to Calvin as a disputant. Calvin's refutation of Servetus's reply greatly exasperated him; he did not attempt any regular answer to it, but contented himself with adding a few notes in the margin grossly abusive of Calvin.

It was now secretly determined in the council of Geneva to put Servetus to death, but the matter being one of great importance, and Servetus having appealed to the judgment of others, it was thought advisable to send copies of his works and of the evidence against him to the clergy of the four Protestant cantons of Zürich, Basle, Berne, and Schaffhausen, and to ask their opinion concerning his guilt. These letters were dispatched about the end of September: the reply from Zürich was received on October 2; that from Basle and from Schaffhausen on October 18, and the date of the arrival of the answer from Berne is not stated. They all concurred in condemning the writings of Servetus, but did not recommend that the author should be put to death, though Calvin chose to put that construction on their replies. As soon as these answers had arrived, the council was once more convened, and sentenced Servetus to be burned to death by a slow fire. Servetus had one friend in the council, Amadæus Gorrius by name, who in vain endeavoured to obtain a pardon for him, or at least that his case should be brought before the council of two hundred; but the violence of Calvin and his party prevailed. Calvin however did attempt to obtain for him the favour of a less painful death, though without success. Accordingly, on October 27, 1553, Servetus was brought to the stake, and his sufferings are stated to have been unusually severe and protracted. No act of barbarity perpetrated by the Roman Catholics ever surpassed the burning of Servetus, in which Calvin appears to have been actuated by private hatred quite as much as by religious fanaticism, and in which he filled all the parts of informer, prosecutor, and judge.

The works of Servetus have had an adventitious value imparted to them by their extreme rarity. With the exception of the short essay on Syrups, published while Servetus was at Paris, they are theological and metaphysical treatises on the most abstruse subjects, such as the doctrine of the Trinity. Mr. Hallam is of opinion that the notions of Servetus concerning the Trinity were not Arian, but rather what are called Sabellian. The 'Restitutio Christianismi' contains a passage which has led some to say that Servetus well nigh discovered the circulation of the blood, and that consequently the merits of our illustrious countryman Harvey are small. Such however is by no means the case. Servetus knew that the septum of the heart is not perforated, but that the blood in the right ventricle communicates with that in the left through the medium of the pulmonary artery, and the circulation through the lungs. But though he formed a perfectly correct conception of the pulmonary circulation, he was quite ignorant of the greater circulation, or of the existence of any means by which blood from the left ventricle is returned to the right; nor does he appear to have seen the necessity for any such provision.

The authorities from which the above Life of Servetus has been compiled are Allwoerden, 'Historia Michaelis Serveti,' Helmstadii, 4to., 1727; the 'Biographie Universelle;' and the notices furnished by Mr. Hallam, in his 'Introduction to the Literature of Europe,' vol. i., p. 507, and vol. ii., p. 107. The famous passage relating to the circulation is given entire by Dutens, 'Origine des Découvertes attribuées aux Modernes,' 4to., London, 1796, p. 163.

SERVIA, a principality newly constituted under an hereditary prince, tributary to the Ottoman sultan, but which was an integral part of the Turkish empire till the beginning of the present century. The boundaries of Servia are, on the north the Austrian territories of the Bannat and Slavonia, on the east Valachia and Bulgaria, on the south Rumili, and on the west Bosnia, from which it is separated by the Drina, an affluent of the Save. The length of Servia from east to west is about 170 English miles, and its breadth about 100 miles. It lies entirely in the basin of the Danube, which river runs along its northern boundary, and is joined by the Save, which divides Servia from Austrian Slavonia, and afterwards by the Morava, which crosses the centre of Servia from south to north, receiving numerous affluents; those on its western or left bank come from the Mounts Stalatz, an offset of the Dinaric Alps which divide the waters of the Morava from those of the Drina, and those on its eastern bank from the Bulgarian mountains, which are offsets of the Balkan range. Servia is a country of mountains and valleys, in great part covered with antient forests. The country has excellent pastures, in which are reared numerous herds of cattle. The population of Servia is roughly reckoned at about half a million of inhabitants, who are mostly of the Greek or Eastern church. The Servians are a branch of the great Slavonian race, and their language is one of the most polished dialects of the Slavonian. [SLAVONIAN LANGUAGE AND LITERATURE.] Travellers have observed a resemblance between the appearance of the Servians and the natives of the Swiss highlands. The country is in a state of progress.

The principal towns of Servia are—1, Semendria, or Sant Andriya, situated at the confluence of the Jessava with the Danube, a fortified town with about 12,000 inhabitants, and the residence of the archbishop-primate of Servia, and the place of assembly of the senate; 2, BELGRADE; 3, Zabatz, or Schabacz, near the Save, a fortified town; 4, Usicza, near the borders of Bosnia, a town of 6000 inhabitants, carrying on a considerable trade; 5, Vallievo, a place much frequented for its markets; 6, Kragojewatz, a small town in the centre of Servia, where a diet of the representatives of Servia proclaimed, in 1830, Milosch and his heirs princes of Servia. The superior court of justice of the principality sits at Kragojewatz, which is also the common residence of the prince.

Prince Milosch has opened a wide road across Servia from Nissa on the frontiers of Rumili to Belgrade.

The county of Servia under the Roman empire formed the province of Mœsia Superior. It was invaded by the Goths under the emperor Valens, and some centuries later by the Servi, a tribe of Slavonians, to whom were allotted some grounds south of the Danube by the emperor Leo VI., in order to oppose them to the Bulgarians, who threatened the very existence of the empire in the tenth century of our æra. By degrees the Servians encroached also upon the territories of the empire, and in the twelfth century the emperor Manuel Comnenus was obliged to fight against them in order to check their incursions. During the subsequent decay of the Eastern empire, and its conquest and partition by the Latins, the Servians established themselves firmly in the country of Mœsia, forming an independent principality under a prince styled Despotes, in the same manner as the neighbouring Slavonian states of Bosnia and Croatia. Murad I., sultan of the Ottomans, married a daughter of the Despotes of Servia; but several years after, the Servians, Hungarians, and other Christian nations near the Danube, alarmed at the progress of the Turks in Albania, collected a large force under Lazarus, Despotes of

Servia, and marched against Murad, who met the Christian army in the plain of Cossowa, near the frontiers of Albania, A.D. 1389, and defeated it with dreadful slaughter, but was himself killed. Lazarus was taken prisoner and killed by the Turks in revenge for the death of their own sultan. In the following century sultan Murad II., who had married the sister of George, Despotes of Servia, turned his arms against his brother-in-law about the year 1440, overran Servia, took the fortress of Semendria, and obliged George to take refuge at Ragusa, from whence he made his way to Hungary, where he joined the gallant Hunnyades, and through his assistance recovered part of his territories. At last Mohammed II., after taking Constantinople, finally conquered Servia, which he annexed to his empire, with the exception of Belgrade, which was bravely defended by the Hungarians under Hunnyades, and was only taken, in 1522, by Solyman the Great. Servia continued a province of the Turkish empire till 1717, when Prince Eugene, at the head of an Austrian army, took Belgrade and conquered a part of Servia, which was ceded by the sultan to Austria by the peace of Passarowitz, 1718. But in the subsequent war of 1739, the Austrians, being worsted by the Turks, lost Servia, and gave up Belgrade also by treaty. Marshal Laudon retook Belgrade in 1788, but Austria gave it up again to the sultan by the peace of Szistova in 1791.

About the year 1804 the Servians, availing themselves of the revolt of Passwan Oglu, pasha of Widin, rose in arms throughout the country against the Porte. They chose for their leader George Petrowitsch, surnamed Kara, or the 'black,' a countryman who, having taken a part in a former unsuccessful insurrection in 1787, had fled into the Austrian territories, and served in the Austrian army in the campaign of 1788-9. After the peace in 1791 Kara George had returned to his country and resumed his profession of herdsman and grazier. He was stern and taciturn, but courageous and robust. In January, 1806, two numerous Turkish armies, one from Bosnia under Bekir Pasha, and the other from Nissa in Rumili under Ibrahim, pasha of Scutari, entered Servia. Kara George had no more than 10,000 men, but they were determined, and knew well the country and the intricacies of its forests. He kept in check both armies, and in the month of August defeated the Pasha of Bosnia, and drove him back across the Drina with great loss. He then turned rapidly against the Pasha of Scutari, who proposed a truce. But the truce not being ratified by the Porte, George surprised and took Belgrade, except the citadel, which surrendered in 1807. Servia was now free from the Turks. A sort of military government was formed, consisting of the wayvodes, or chief proprietors of the various districts, each of whom was at the head of a body of cavalry formed of his tenants and friends. The wayvodes assembled once a year, about Christmas, at Belgrade, to deliberate, under the presidentship of Kara George, upon the affairs of the country. A senate of twelve members, one elected by each district of Servia, constituted the permanent executive. Mutual jealousies and dissensions soon broke out between the principal wayvodes and Kara George. The latter, in order to strengthen his power, undertook the invasion of Bosnia in 1809, whilst Russia was at war with the Porte. He proved unsuccessful, and was obliged to retire into Servia, protected by a diversion made by a Russian corps on the side of the Danube. In 1810 he defeated Curschid Pasha, who had advanced from Nissa with 30,000 men, and soon after he routed another army from Bosnia, and drove it back across the Drina. He availed himself of these successes to obtain from the diet of 1811 more ample powers, and a sort of ministry, which resided continually near his person. The Porte proposed to acknowledge Kara George as Hospodar of Servia, on condition that the Turks should garrison all the fortresses and keep the arsenals and arms. It was easy for persons acquainted with Ottoman policy to foresee what would be the results of such an arrangement. The negotiations lasted till 1813, when the news of the success of Napoleon in Germany freed the Turks from the fear of Russia, and stimulated them to make a last effort against Servia. Two Turkish armies advanced, drove before them some Servian corps, and carried several strongholds. Kara George, losing on a sudden his firmness, crossed the Danube and took refuge in the Austrian territories, where he was confined in a fortress in which he died some years after. Universal discouragement followed, and the Turks occupied the whole country and entered Belgrade. Servia became again a pashalik. The wayvode Milosch Obienowitsch alone kept up the insurrection about Jagodino, in the southern districts, but was at last obliged to accept the amnesty offered by the pasha for himself and followers. The Turks however having contrived to get into their hands the leaders of this last insurrection, shot a number of them, regardless of the amnesty, and empaled thirty-six of them at Belgrade, in front of the pasha's palace, in 1815. Milosch himself had the good luck to escape; he ran to the mountains, and the insurrection began afresh. Having assembled the Heyduks, a kind of Slavonian Klephts, and the fugitives and emigrants of the former insurrection, he attacked the kiaya, or lieutenant of the pasha, who had advanced against him from Belgrade at the head of 10,000 men. The kiaya was defeated with the loss of his artillery and baggage. The pasha came out of Belgrade with the rest of his troops, and was likewise defeated, and obliged to retire to Keupri under an escort given him by Milosch. Curschid, pasha of Bosnia, sent another army under his lieutenant Ali, who was defeated, taken prisoner, and sent back to his master with presents. Milosch afterwards went himself to the camp of Curschid Pasha to undertake negotiations of peace. The only article upon which they could not agree was that Milosch wished the Servians to remain armed, to which the pasha would not consent. When Milosch rose to mount his horse, the pasha's janizaries fell upon him, but Ali, who had been so generously treated by Milosch, interposed, representing that Milosch had come spontaneously and under a safe conduct, which ought not to be broken. Ali's firmness saved Milosch, who was allowed to depart. The negotiations continued; Servian deputies were sent to Constantinople, and at last a firmaun of peace came, appointing another pasha friendly to the Servians. Belgrade and the other fortresses were to remain in the hands of the Turks, but the Servians retained the administration of the country, their senate, and they alone taxed themselves.

Milosch restored with some modification the constitution established by Kara George. He created a provincial administration; every district or knef has its kneven or civil officer, and every great division or province has its obar-kneven, all of whom are paid by the treasury. Judicial courts are established in the various districts, and a court of appeal sits at Kragojewatz for the whole principality. A code, based mainly on the French code, has been compiled. The clergy are subject to the same laws and amenable to the same courts as the laity, and they receive a salary from the state. Elementary schools have been established in the various districts. Every able-bodied man is a soldier, and has his own arms. Belgrade has a small Turkish garrison, and is the residence of a pasha, who has no direct authority in the affairs of the country. Servia pays a fixed amount of tribute to the Porte, which is yearly delivered by the prince into the hands of the pasha. The natives of Servia are allowed to trade all over the Ottoman empire, when furnished with Servian passports. Such is the settlement of the affairs of Servia since 1830.

(Balbi; La Martine, *Voyage en Orient*, 1833; Pirch, *Reise in Servien in* 1829.)

SERVICE. (Law.) [Servant.]

SERVICE, the name given in English cathedral music to the *Te Deum* and *Jubilate*, the *Magnificat* and *Nunc Dimittis*, the *Cantate Domino* and *Deus Misereatur*, collectively or separately; and sometimes applied, very erroneously, in our concert books, to the whole or portions of the mass.

SERVITES, or Servants of the Blessed Virgin, a religious order first instituted in Tuscany, A.D. 1233, by seven Florentine merchants. This order, though subjected to the rule of St. Austin, was nevertheless erected in commemoration of the most holy widowhood of the blessed Virgin, for which reason its monks wore a black habit, and observed several rules not practised in other monasteries. Benedict, bishop of Florence, having given his approval to the institution of this order, pope Clement VI. granted it a bull of confirmation in 1266. Innocent V. took measures to abolish it; but dying before he had completely effected his intentions, it was again taken under papal protection by Honorius IV. in 1286. In the fifteenth century Martin V. and Innocent VIII. declared that the Servites formed a fifth mendicant order.

Toward the close of the sixteenth century it was found that the Servites had fallen off from their early strictness;

and in 1593 the order was re-established in its original austerity in the hermitages of Monte-Senario, where the reformed brothers took the title of *Servites-Eremites*. This order continues to exist in Italy.

Father Paul Sarpi, the well-known author of the 'History of the Council of Trent,' was a Servite.

(Mosheim, *Eccles. Hist.*, 4to., Lond. 1765, vol. i., p. 653; *Hist. des Ordres Religieux*, par M. Henrion, 8vo., Brux., 1838, p. 171-173.)

SERVITOR. [SIZAR.]

SE'RVIUS TU'LLIUS, the sixth king of Rome, reigned from 578 to 534 B.C. The history of his birth was handed down by tradition in three different ways. The most marvellous and probably the most antient legend represents him as the son of Ocrisia, a slave of Queen Tanaquil, and of a god, who according to some was Vulcan, but according to others, one of the household-gods of the royal family. (Ovid, *Fast.*, vi. 625, &c.; Dionys., iv., p. 207, Sylburg.) A second legend describes his mother as a slave of the Etruscan town of Tarquinii, and his father as a client of Tarquinius Priscus; and Servius himself, according to the same account, was in his youth a slave. (Cic., *De Republ.*, ii. 21.) The third account, which however seems to be merely an arbitrary interpretation of the second, made with the intention of giving to the story a somewhat more probable appearance, represents Servius Tullius as the son of a man of the same name, who was of royal descent, lived at Corniculum, one of the Latin towns, and was slain when his native place was taken by the Romans. His wife Ocrisia, then in a state of pregnancy, was conveyed to Rome and assigned to Queen Tanaquil, who, considering her rank, soon restored her to liberty and treated her with great regard. (Liv., i. 39; Dionys., iv., p. 206.) Ocrisia was delivered of a son whom she called Servius Tullius, after the name of her husband. One day, continues the story, when the boy was asleep, his head was seen surrounded with flames. The queen, being informed of the wondrous sight, said that the child was destined to do great things, and forbade the flames to be extinguished; when the child awoke, the flame disappeared. He was henceforth brought up and educated as the king's own child. If in the course of his education he became, as Cicero supposes, acquainted with the affairs of Greece, this would in some measure account for the analogy between the constitution of Solon and that which Servius afterwards gave to the Romans. Fortune, who had so signally favoured Servius in his childhood, continued her partiality for him, raised him to the highest honours that man can attain, and even made him the object of her love. (Ovid, *Fast.*, vi. 570, &c.) He made a grateful return by dedicating to her a temple outside of the city. (Varro, *De Ling. Lat.*, v., p. 56, ed. Bipont.)

When Servius Tullius had grown up to manhood, he distinguished himself in several battles against the Etruscans and Sabines, and he was also a useful counsellor in the affairs of the administration. The king not only rewarded his services with the hand of one of his daughters, but in his old age frequently entrusted him with the management of his private as well as public affairs, and in the discharge of these duties Servius evinced such wisdom and justice, that he soon became the favourite of the people. When the king was murdered by the sons of Ancus Marcius, and Tanaquil concealed his death from the people, they willingly submitted to the regency of Servius, whom the king was said to have appointed to govern in his stead until his recovery, which probably means that he was appointed custos urbis (præfectus urbi) in which capacity he had a right to hold the comitia for a new election, as he afterwards did (*populum consuluit de se*). When the death of the king became known, Servius was, as Livy (i. 41) says, made king by the senate, but without a decree of the populus; but according to Cicero and Dionysius (iv., p. 218), he found his chief support in the populus, who gave him the imperium by a lex curiata. The sons of Ancus Marcius, seeing their hopes frustrated, went into exile, and Servius Tullius, to prevent any hostile feeling on the part of Lucius and Aruns Tarquinius, the sons of his predecessor, gave them his two daughters in marriage. The inconsistency of this part of the legend with chronology has been pointed out by Niebuhr.

After Servius had thus established himself on the throne, he made a successful war against the Veientines and some other Etruscan towns, which Dionysius represents as a war with all Etruria. This is the only war which is said to have occurred during his reign, which, like that of Numa Pompilius, was a reign of peace. The most memorable events of the reign of Servius Tullius are his fortification and extension of the city [ROME, vol. xx., p. 100, &c.], and the new constitution which he is said to have given to the Roman state. Several of the Latin towns already belonged to Rome, and had grown up with it into one nation, and this nation was leagued with the other independent Latins. Servius effected a federal union among these nations, and induced the Latins, who had hitherto held their general meetings at the fountain of Ferentina, to build at Rome, on the Aventine, a temple of Diana, as the common property of the Latins and Romans. The Latins agreed, and this was on their part a tacit acknowledgement of the supremacy of Rome. (Liv., i., 45; Dionys., iv., p. 230.) The Sabines appear to have likewise been included in this confederacy, and to have joined the Latins and Romans in the worship at the common sanctuary of Diana; for the story is, that a Sabine attempted to gain the supremacy for his own nation: he possessed among his cattle a cow of extraordinary size, and the soothsayers declared that the government should belong to that nation whose citizen should sacrifice this cow to Diana on the Aventine. He therefore took the animal at an opportune time to Rome. But the Roman priest, who had been informed of the prophecy, reprimanded the Sabine for attempting to sacrifice with unclean hands, and bade him go down to the Tiber and wash them. The Sabine obeyed, and the Roman in the meanwhile sacrificed the cow to Diana. According to Livy it was not until this time that the populus unanimously declared Servius their king.

But although Servius was the favourite of the people, a storm was gathering over his head, which ultimately terminated his life in the tragic manner so inimitably described by Livy (i. 47). Lucius Tarquinius, the son of Tarquinius Priscus, had never given up the hope of occupying the throne of his father; and stimulated by Tullia, the wife of his brother Aruns, he agreed with her to murder his wife and his brother, and to unite himself with her, that thus they might be able the more energetically to prosecute their ambitious and criminal designs. Lucius, now urged on by his unnatural wife, one day appeared in the senate with the badges of royalty. As soon as the aged king heard of the rebellious act, he hastened to the curia, and rebuked the traitor, but he was thrown down the stone steps of the curia, and on his way home he was murdered by the servants of his son-in-law. His body was left lying in its blood. Tullia, the wife of Lucius, anxious to learn the issue of his undertaking, rode in her chariot to the curia; but her more than brutal joy at his success induced even Tarquin to send her home. On her way thither she found the corpse of her father, and ordered her servant to drive over it. The place where this took place was ever after termed the Vicus Sceleratus (Ovid, *Fast.*, vi. 598; Dionys., iv., p. 242; Varro, *De Ling. Lat.*, iv., p. 44.)

Such are the legends which were current among the Romans about Servius Tullius; and although they may be based on some historical groundwork, yet in the form in which they are handed down they are little more than fiction. The existence of a king, Servius Tullius, cannot however be denied. The Etruscan traditions, as we learn from an antient inscription (ap. Gruter, p. DII.) which contained a speech of the emperor Claudius, stated that Servius, originally called by the Etruscan name of Mastarna, was a follower of Cæles Vivenna; and that after being overwhelmed by disasters, he quitted Etruria with the remains of the army of Cæles, and went to Rome, where he occupied the Cælian hill, and afterwards obtained the kingly power. (See Niebuhr, *Hist. of Rome*, i., p. 381, &c.) But it is not improbable that this version of the story merely arose from the circumstance of Servius being received at Rome among the Luceres or Etruscans (Göttling, *Gesch. d. Röm. Staats*, p. 231), for two other legends describe him as a Latin; and the whole spirit of his legislation seems to warrant the conclusion that the man who devised the constitution ascribed to him could not have been an Etruscan, but must have been a Latin. How much of the tragic story of his death may be historical cannot be decided, nor is it of great importance. This however seems to be clear, that at the end of the career of Servius a counter-revolution took place, which frustrated all the beneficial workings of his new constitution, and showed its fruits in the tyrannical rule of his successor.

The constitution of Servius Tullius was always looked upon by the Romans as the basis of their civil and political institutions; and there is no doubt that in subsequent ages much more was attributed to him than he actually did, and that the plebeians in particular considered him as the great protector of their order, who had granted them almost all the rights which they afterwards regained one by one in their unwearied struggles with the patricians. What Servius actually did for the Romans has been the subject of much discussion among the continental scholars ever since the time that Niebuhr's work appeared. We shall only give a sketch of the constitution of Servius, and refer our readers to the best modern works on the subject.

Servius is said to have commenced his legislation by dividing the public land which was taken from the Latins among those citizens (of course plebeians) who, owing to their poverty, were compelled to work for wages; and by sanctioning, through the Comitia Curiata, about fifty laws relating to contracts and injuries (*νόμοι συναλλακτικοὶ καὶ περὶ τῶν ἀδικημάτων*: Dionys., iv., p. 218), which were probably intended to regulate the relations between the two estates. He divided the city, with the exclusion of the Capitoline and Aventine, into four regions, three of which answered to the three original townships or tribes of which Rome consisted. All the plebeians who dwelled in any of these regions formed a tribus; so that all the plebeians of the city were divided into four local tribes (tribus urbanæ). Their names were Tribus Suburana, Palatina, Esquilina, and Collina; and these tribes continued to the time of Augustus. The plebeians who inhabited the country around and subject to Rome, were divided into twenty-six local tribes (tribus rusticæ), which are sometimes also called regions. This division of the country plebeians is not mentioned by Livy at all; and Dionysius found different and contradictory accounts of it, but he preferred the statement of Fabius Pictor, who mentioned the twenty-six rustic tribes. The subject however might still seem to be involved in difficulties, inasmuch as Livy (ii. 16) states that, in the year 495 B.C., the whole number of tribes was only twenty-one. This difficulty however is removed by the plausible conjecture of Niebuhr (i., p. 416, &c.), that in the war against Porsenna Rome lost a third of its territory—that is, ten regions or tribes; so that there remained only twenty, to which, after the immigration of the gens Claudia with its numerous clients, the twenty-first tribe (tribus Claudia, afterwards tribus Crustumina) was added. The names of the sixteen rustic tribes which continued to exist after the war with Porsenna are: tribus Æmilia, Camilia, Cluentia, Cornelia, Fabia, Galeria, Horatia, Lemonia, Menenia, Papiria, Pollia or Publilia, Pupinia, Romilia, Sergia, Veturia, and Voltinia. (Niebuhr, i., p. 419; Göttling, p. 238.) To these were added, in 387 B.C., the tribus Stellatina, Tromentina, Sabatina, and Arniensis; in 357 B.C., the tribus Scaptia; in 318 B.C., the tribus Ufentina and Falerina; in 301 B.C., the tribus Terentina and Aniensis; and lastly, in 241 B.C., the tribus Velina and Quirina. The number of tribes thus amounted to thirty-five, and it was never increased. The number of thirty tribes instituted by Servius Tullius was equal to that of the patrician curiae; both divisions however existed independent of each other, the one comprehending only the patricians, and the other the plebeians. The clients were probably not contained in the Servian tribes. (Niebuhr, i., p. 421; Walter, *Gesch. d. Röm. Rechts*, p. 30, note 5.) Göttling (p. 236) assumes the contrary, but his arguments are not convincing. The division of the plebeians into a number of local tribes was nothing beyond a regular organization of the body of the plebes, of which they had indeed been in need; but it did not confer any other rights upon them than what they possessed before. At the head of each tribe, in the city as well as in the country, was a tribune (φύλαρχος), who was appointed by the members of his tribe. He had to keep a register of all his tribesmen, and he levied the troops and taxes in his tribe. The plebeians now held their own meetings according to their tribes, as the patricians held theirs according to their curiae. The tribes had also their common festivals: those of the city were called the Compitalia, and those of the country the Paganalia.

The first step by which Servius promoted the liberty of the people was the institution of judices for private actions, which had formerly been part of the jurisdiction of the kings. (Dionys., iv., p. 228, &c.) These judices were, according to the supposition of Niebuhr (i., p. 428; comp. Göttling, p. 241, &c.), the court of the Centumviri, for which three members were chosen from every tribe. The number of the court however would then be only ninety. But see *Dict. of Greek and Roman Antiq.*, under 'Centumviri.'

But the chief part of the Servian constitution was his census, according to which he divided the whole body of Roman citizens, both the patricians, with their clients, and the plebeians, into five classes. The first class comprised those whose property amounted to at least 100,000, or, according to others, at least to 110,000, 120,000, or 125,000 asses. [As.] (Liv., i. 43; Dionys., iv., p. 221; Plin., *Hist. Nat.*, xxxiii. 13; Gellius, vii. 13; Cic., *De Republ.*, ii. 22.) The second class included those who had at least 75,000 asses; the third, those who had at least 50,000; the fourth class, those who had at least 25,000; and the fifth class, those who had at least 12,500, or, according to Livy, 11,000 asses. The members of each of these classes were divided into juniores, or men from seventeen to forty-five years old; and seniores, or men from forty-five to sixty years. The latter, though they had still to perform military service, remained at Rome for the protection of the city; while the former went out into the field, and served in the regular armies. All had, according to their higher or lower census, to equip themselves with a more or less complete suit of armour. All public burdens for the maintenance of the state and the armies were distributed among these classes, in such a manner that the heaviest duties fell upon the wealthiest, who had at the same time practically the greatest influence in public affairs. All Romans whose property did not come up to that of the fifth class were kept apart from the classes. Dionysius indeed says that they were formed into a separate class. They were however subdivided into capite censi and proletarii: among the former were reckoned all those who possessed no more than 375 asses, and among the latter those who possessed from 375 to 1500 asses. These two divisions were exempt from the tributum, and, with few exceptions, also from service in the army; but they had to pay a head-tax. It is a very ingenious supposition of Niebuhr, that all those who possessed more than 1500 asses, but less than the census of the fifth class, formed the accensi and velati in the Roman army, that is, a class of reserves who went into the field without arms, and stepped into the places of those who had fallen, whose armour they also took. All the citizens who were comprised in the classes were called assidui or locupletes, in contradistinction to the rest. (Cic., *De Republ.*, ii. 22; Gellius, xvi. 10.)

After the taxation and the military duties of the Romans were thus regulated by the census, Servius proceeded to determine their rights by the same standard. For this purpose he subdivided each of the five classes into centuries, each of which was to have a vote (suffragium) in the great national assembly which they were to form (comitia centuriata, or comitiatus maximus). The number of centuries however was not the same in all classes: the first class, though the smallest in numbers, received the greatest number of centuries or suffrages, in order that those who had to bear the heaviest burdens might also have the greatest influence in public affairs. The first class was thus divided into eighty centuries; the second, third, and fourth classes into twenty centuries each; and the fifth class into thirty centuries. The whole number of centuries thus amounted to one hundred and seventy. This division was made with a view to form the Roman army, and the whole number of centuries represented the Roman citizens as a military body. Hence half the number of centuries in each class consisted of the seniores, and half of the juniores. The seniores, though fewer in numbers, had thus equal influence with the juniores, so that all political power was distributed with a due regard to age as well as to property. (Gellius, xv. 27.) But to these one hundred and seventy centuries, five others were added, independent of the census, partly to give them a compensation for the active part which their members took in the army; partly, perhaps, that they might be the means of forming a majority in cases where opinions were equally divided between the seniores and juniores. The first two additional centuries were the centuriæ fabrorum, which Livy describes as being assigned to the eighty centuries of the first class, and Dionysius as belonging to those of the second class. Cicero assigns the fabri to the first class, but only as one century. The difficulty arising from these different accounts may be removed by the supposition that of the two centuries of the fabri, one was assigned to each of the first two classes; and if this supposition be correct, it is highly probable that the three other additional centuries, viz. those of the accensi, cornicines, and liticines or tubicines, were likewise assigned one to each of the three last classes. Dionysius says that the five additional centuries were, like the one hundred and seventy others, divided into seniores and juniores.

These one hundred and seventy-five centuries formed the whole body of infantry in the Roman army. The cavalry was likewise represented by a number of centuries. Twelve centuries of equites existed before the time of Servius [Rome, vol. xx., p. 104], and to these he added six new ones. Dionysius speaks as if Servius had created eighteen new centuries of equites; and Livy (provided the reading in i. 43, be correct), forgetting the six centuries of equites made by Tarquinius Priscus, states that Servius made twelve new centuries in addition to the existing six. The twelve centuries of equites which existed previous to the legislation of Servius, belonged to the patricians, and had their dignity as equites independent of the census, though they naturally belonged to the wealthiest class. The six new centuries of Servius were formed of the wealthiest plebeians of the first class, and were called the sex suffragia, as they had six votes in the assembly of the centuries. (Göttling, p. 253, &c.) Cicero reckons all the eighteen centuries of equites as belonging to the class which had the highest census, whereas Dionysius seems to distinguish between those equites who belonged to the first class, and the patrician equites. The only distinction between these two classes of equites in the comitia centuriata was that the patricians gave their vote before the plebeian equites. We do not know whether there were any other distinctions. They were however in so far placed on a footing of equality, that all of them received a horse from the state (equus publicus), or money to purchase one, together with an annual sum for its support, which sum was raised by a tax on the unmarried women, widows, and orphans (æs hordearium).

The whole body of the Roman people who performed service in the army, and had a right to vote in the great assembly, was thus contained in one hundred and ninety-three centuries, of which one hundred and eighty-one had been newly created. The eighty centuries of the first class, together with the six suffragia of plebeian equites and one century of fabri, formed a decided majority in the comitia centuriata, for they amounted to eighty-seven centuries; whereas all the other classes together had only eighty-four centuries. The votes in the great comitia, which were always held in the Campus Martius, were first given by the twelve centuries of patrician equites; next came the six suffragia of plebeian equites; and then the centuries of the several classes, beginning with those of the first class. If therefore the equites and the centuries of the first class agreed among themselves in the comitia, a question was decided at once, without being put to the vote of the remaining centuries. The centuries of the last classes thus had in theory equal rights in their comitia with those of the first class; but practically they seldom exercised these rights, as in most cases the majority was manifest, before a question came to be put to their vote. The comitia of the centuries now received the rights which, until then, had been the exclusive possession of the curiæ, that is, to decide on peace and war, to elect the kings, and subsequently the chief magistrates of the republic; and to pass new laws or abolish old ones. (Dionysius, iv., p. 224.) But the assemblies of the curiæ still existed. New laws were not often brought before the centuries, on account of the firm adherence to antient usages; and whenever they were brought before them, it could only be done after they had obtained the sanction of the senate. The election of a king was confined to those candidates who were proposed by the senate through an interrex; and such an event could not happen frequently, as the office of the king was for life. It was a further check upon the comitia centuriata, that when a question was decided by them, it still required the sanction of the comitia curiata; so that in point of fact the patricians, in the senate and their comitia curiata, possessed a very great preponderance over the commonalty. The only advantage therefore which Servius had given to the plebeians was, that the wealthy members of their order had an opportunity of meeting the patricians on a footing of equality, and the way to this honour was of course open to every plebeian. As we are not informed that Servius Tullius admitted any of the plebeians into the senate, it seems to have been his intention to exclude them from all the offices which were in the exclusive possession of the patricians. This shows at the same time the improbability of the story according to which Servius intended to resign his royal dignity, and to appoint two consuls, one of whom should be a plebeian. Niebuhr is inclined to think that almost all the rights which the plebeians acquired in the course of time, had been originally granted to them by the constitution of Servius Tullius, and that they had been deprived of them during the reign of Tarquinius Superbus. But this theory seems to be supported rather by the stories which in subsequent ages became current of the good king Servius, than by what must be considered as historically established in regard to his constitution. Nothing is more natural than that the benefits which Servius actually conferred upon the plebeians should in after-times, when they were abolished, have been greatly magnified, as if he had placed the plebes on a footing of perfect equality with the patricians.

Respecting the reign and constitution of Servius Tullius, the reader may, besides the work of Niebuhr, consult Huschke, *Die Verfassung des Königs Servius Tullius, als Grundlage zu einer Römischen Verfassungsgeschichte entwickelt*, Heidelberg, 1838, 8vo., a work which is more based on speculation than on an accurate examination of the antient authorities; Zumpt, *Ueber Abstimmung des Römischen Volkes in Centuriat Comitien*, Berlin, 1837, 4to.; Göttling, *Geschichte der Römischen Staatsv.*, p. 230-267; Walter, *Gesch. d. Röm. Rechts*, p. 29-37; Rubino, *Ueber den Entwickelungsgang der Römisch. Verf. bis zum Höhepunkt der Republik*, vol. i., Marburg, 1839, 8vo.; Hüllmann, *Römische Grundverfassung*, Bonn, 1832, 8vo., and, by the same author, *Ursprünge der Römischen Verfassung durch Vergleichungen erlaütert*, Bonn, 1837, 8vo.

SE'RVIUS, MAU'RUS HONORA'TUS, a Roman grammarian. The time at which he lived is not quite certain, for some writers place him in the reign of Valentinian, and others in that of Hadrian; but it is almost beyond doubt that he lived towards the close of the fourth century, perhaps in the reign of Theodosius I. (Macrob., *Sat.* i. 2.)

The principal works of Servius are his Commentaries on the Æneid, the Georgics, and the Eclogues of Virgil. These commentaries are not only useful for a correct understanding of the poems of Virgil, but they are rendered still more valuable to us by the vast stores of learning which their author possessed; they contain information on a variety of subjects connected with the history, antiquities, and religion of the Romans, and of which we should otherwise be totally ignorant. Many valuable fragments of other writers, whose works are now lost, are preserved in the commentaries of Servius. It is however to be lamented that these commentaries have come down to us in a very interpolated condition, so that they cannot be used without great caution. Besides these commentaries, we possess of Servius three smaller grammatical works: 'In Secundam Donati Editionem Interpretatio;' 'De Ratione Ultimarum Syllabarum Liber ad Aquilinum;' and 'Ars de Pedibus Versuum, sive de Centum Metris.'

The commentaries on Virgil are printed in several of the early editions of this poet; but the best modern editions are that of Burmann, in his edition of Virgil, and a separate one by H. A. Lion, under the title 'Servii Mauri Commentarii in Virgilium; ad fidem cod. guelferbyt. aliorumque recens. et potior. var. lect. indicibusque copiosiss. instruxit, &c.;' Göttingen, 1825-26, 2 vols. 8vo. Compare Burmann, 'Præfat. ad Virg.,' p. ******; Heyne, 'De Antiquis Virg. Interpret.,' p. 536, &c.; Fabricius, 'Biblioth. Lat.,' i., p. 319. The three smaller works of Servius are printed in 'Putschii Grammatici Latini.'

SE'RVIUS SULPI'CIUS RUFUS. [Sulpicius.]

SE'SAMUM (σήσαμον), a genus of plants of the natural family Sesameæ, sometimes called Pedalineæ, containing only few genera and species. The name Sesamon occurs in Greek authors. (Herod., i. 193; iii. 117; Xenophon, *Anab.*, i., c. 2.) *Simpsen*, or *Simsem*, is the Egyptian and Arabian name of one of the species, remarkable for the quantity and quality of the oil expressed from its seeds, which is employed as an article of diet in Eastern nations, on which account the seeds form an article of commerce from India and Egypt in the present day. The genus Sesamum is distinguished by having a 5-parted calyx; corol with a short tube; bell-shaped throat; and the limb quinquifid, somewhat bilabiate. Stamens four, didynamous, with the rudiments of a fifth stamen. Stigma bilamellate. Capsule oblong, 4-celled, 2-valved. Seeds numerous. The species, though now cultivated in many countries, are supposed to have been originally natives of India. They form annual plants, with opposite and alternate leaves, and axillary solitary flowers. The species are by some considered to be five in number, that is, S. orientale, indicum, luteum, laciniatum, with S. radiatum, said to be a native of Guinea. Others consider them all to be varieties of one species. These are cultivated in various countries, but especially in India, Egypt, and Syria. They have also been taken to the West Indies, where the plant is called banglo and oil-plant. Sesamum seeds are sometimes added to broths, frequently to cakes by the Jews, and likewise in the East. The oil which is expressed from them is bland, and of a fine quality, and will keep many years without becoming rancid, and is often used in India as a salad oil. It is known by the name of Sesamum and of Gingle oil; also *til ke tel*, or *meetha tel*, that is, sweet oil. The leaves of the plant are mucilaginous, and employed for poultices. Of the seeds, two varieties are known in commerce, one white and the other black. The former is called *saffed* (or white) *til* in India. Of this the plant is smaller and straighter, with fewer branches and leaves, and is not so common as the *kala* (or black) *til*. Of this the plant is more spreading and leafy; also larger, being sometimes four or five feet high, with the lower leaves three lobed, and the upper entire. The kala til, or black sesamum seed, must not be confounded with another, to which the same name is applied, as this is the seed of one of the Compositæ, sometimes called Vesbesina sativa, but, more correctly, Guizotia oleifera. Of til seed there was exported from Calcutta of bazar maunds (each 82lbs.), in 1837, 18,559, and in 1839, 38,537; and of til or teel seed oil, 1354 and 3513¾ maunds in the above years. Sesamum seed is also imported into this country from Egypt, and is said to be generally of a finer quality; but there is no reason why India should not produce and export the finest, if care is taken in the selection of the seed for cultivation, and in the subsequent cleaning and packing, in which Indian products are usually defective.

SESBA'NIA, a genus of plants of the natural family of Leguminosæ, which is so named from the Arabic name of the species which is indigenous in Egypt. The rest are found in the equinoctial parts of the world, but the most remarkable in India. The genus is characterised by having a 5-cleft or 5-toothed calyx. The standard of the corol roundish, larger than the keel, which is obtuse, 2-edged at the base. Stamens diadelphous (9 and 1), with the sheath auricled at the base. Legume elongated, slender, torulose, many-seeded. The species form shrubs or herbs with abruptly pinnate leaves, many pairs of leaflets, cauline stipulas lanceolate, and the petiole ending in a bristle point. Flowers axillary, racemose, usually yellow.

S. ægyptiaca, the Egyptian species, found also in India, forms a small and very elegant tree; its wood is employed in making the best charcoal for gunpowder. *S. cannabina*, the *Dhanchi* of Bengal, is not found wild. It is cultivated on account of the fibres of its bark, which are coarse, but more durable than some other substitutes for hemp, especially when exposed to wet, and are therefore generally employed for the drag-ropes and other cordage about fishing-nets.

The soil in which it is grown is generally low and wet, and does not require much preparation, as the plant is hardy and rapid in growth; this renders it advantageous to cultivate, especially as it is considered a meliorating crop. The time of sowing is when the soil has been moistened by the fresh showers in May. About thirty pounds of seed are allowed to an acre. The crop is ready to cut in September and October, though the fibre does not suffer if left standing till the seed is ripe in November. The process of steeping and cleaning the fibre is similar to that required for *sun* (*Crotalaria juncea*). The general produce of an acre is from one hundred to one thousand pounds of ill-cleaned fibre. The current price is somewhat less than that of *Paat* (*Corchorus olitorius* and *capsularis*). The expense of cultivation, including land-rent, is about nine rupees.

SE'SIA, VAL DI, or VALSESIA, a province of the continental Sardinian states, is also called in the administrative language 'Provincia di Varallo,' from the name of the head town. It consists principally of an alpine valley, about 30 miles long, and from 10 to 15 wide, through which runs the river Sesia, which has its source at the foot of Mount Rosa, and flowing first east, and then south-east, leaves the highlands and enters the plain of Vercelli to join the Po. The province of Val di Sesia is bounded on the north by the Swiss canton of the Valais, from which it is separated by the lofty group of Mount Rosa, west by the provinces of Aosta and Ivrea, south by those of Biella and Novara, and east by that of Pallanza. The population amounts to 35,000 individuals, distributed among 45 parishes or communes. The principal town, Varallo, with about 2700 inhabitants, has an old collegiate church, remarkable for a beautiful altar-piece by Gaudenzio Ferrari, a native painter of the sixteenth century, and a pupil of both Leonardo da Vinci and Raffaello, who is little known, though he deserves to be known. A sanctuary on a neighbouring hill, called 'il Sacro Monte,' is much frequented by pilgrims. It consists of a succession of chapels, forty-two in number, containing a series of fresco paintings and of sculptures, which represent the life of our Saviour. Many of the paintings are by Gaudenzio Ferrari, and his pupils Stella and Luini; others are by Fiammenghino, Morazzone, and Bargnola. The whole is very interesting, but unfortunately the frescoes are decayed through neglect. The engraver Bordiga at Milan has published plates of those by Ferrari in his work, 'Notizie intorno alle Opere di Gaudenzio Ferrari, Pittore e Plasticatore,' 4to., Milan, 1821. A convent of Franciscan friars is at the foot of the hill, and the church is also adorned with paintings by Ferrari. The plan of the sanctuary was traced by Father Bernardo Caimo of Milan, who had been guardian of the convent of the Sepulchre at Jerusalem in the 15th century. Fobello, a small town in the mountains, about ten miles from Varallo, is remarkable for the comeliness of the women. Borgosesia, a town of 2500 inhabitants, on the high road from Varallo to Vercelli and Novara, carries on considerable traffic. The nature of the soil, and the habits of the people of the Val di Sesia are similar to those of the neighbouring valleys of Novara. [NOVARA, VALLI DI.] Many of the men leave their country to seek for subsistence by various trades in other countries, and some return home with money, to spend their old age where they were born. The Val di Sesia retained its independence during the middle ages till 1415, when the people voluntarily paid allegiance to Filippo Maria Visconti, duke of Milan, on the condition of not being subject to any taxation or personal service without their consent. They retained this privilege under the Spanish governors of Lombardy till the war of the Spanish succession, when the Val di Sesia was given to the house of Savoy. The people even now seldom have recourse to the judge who resides at Varallo; but if any dispute occurs, arbitrators are appointed, called by the name of Biedersloni, 'loyal men,' to whose judgment the parties submit. (Bertolotti, *Peregrinazioni*.)

SESO'STRIS (Diodorus calls him Sesoosis, sometimes he is called Ramses the Great), the greatest of the early kings of Egypt. He is the third king of the twelfth dynasty of Manetho, and, according to Herodotus (ii. 102), the successor of Moeris; but Diodorus (i. 53) places him seven generations after Moeris. The exact time of his reign is uncertain, but the most common opinion is that it was about the year 1500 B.C. What has been handed down to us as the history of Sesostris, contains such exaggerated accounts of his military exploits, that we must suppose the achievements of several kings, who perhaps bore the same name, to be ascribed to one. There is however no reason to doubt his personal existence, and as his history serves to explain many of the remains of Egyptian art and architecture, it will be necessary to relate the antient traditions.

The father of Sesostris had all the male children who were born in Egypt on the same day with Sesostris educated with his son, and gave them a regular military training, that they might become attached to their king and be enabled to endure with him all the hardships to which they might be exposed during his career as a conqueror. (Diod., i. 53.) His first expedition was during the lifetime of his father, into Arabia, which he conquered. Hereupon, though still a young man, he was sent by his father into the countries west of Egypt, and made himself master of the greater part of Libya. After the death of his father, when he came to the throne, he determined to realize a prophecy according to which he was to become master of the whole inhabited earth. But before he set out, he endeavoured to secure the good will of the Egyptians, for he is represented as king of all Egypt. He divided the country into 36 districts (νομοί), each under the government of a nomarch. He then raised an army of 600,000 foot, 24,000 horse, and 27,000 beasts of burden, giving the command of its numerous subdivisions to those warriors who had been educated with him, and whose number was above 1700. To these men he also assigned the best portions of the land (Diod., i. 54), for he is said to have divided the whole country into equal parts, and to have assigned one to every Egyptian. (Herod., ii. 109.) His first attack was directed against the Æthiopians, who were subdued, and compelled to pay annual tribute, consisting of ebony, gold, and ivory. He then sent out a large fleet of 400 long ships, the first that were built in Egypt. This fleet sailed down the Red Sea, and round the whole coast of Asia as far as India, and all the nations on the coasts were conquered. Sesostris in the meanwhile traversed Asia with an army, and penetrated as far as the eastern bank of the Ganges, nay, even to the coasts of the eastern ocean. (Comp. Plin., *Hist. Nat.*, vi. 34.) When all Asia was thus rendered subject to him, he returned in a north-western direction, and reached Scythia on the banks of the Tanais. Traces of the conquests of Egyptian kings in India are still visible on some Egyptian monuments. (*Egyptian Antiquities*, vol. i., p. 391.) Prosecuting his plan, the king crossed the Tanais, and marched through Thrace, where however he met with great difficulties, partly from want of provisions and partly from the difficult nature of the country, and he therefore ceased carrying his conquests any farther. In all countries which he had conquered he is said to have erected columns with Egyptian inscriptions recording his conquests; in some places he erected his own statue, four cubits and one foot high, for such was his own natural stature. The columns erected in Palestine, and two figures of the king cut into the rocks in Ionia, were seen by Herodotus (ii. 106) himself, and in Æthiopia they appear to have been known in the days of Strabo (xvii., c. 1, p. 420; xvi., p. 386, ed. Tauchnitz).

This vast campaign had lasted nine years, and the king, after having settled the tributes to be paid to him, collected his prisoners and spoils, and returned to Egypt. On his arrival at Pelusium he was nearly burned in his tent with his wife and children, through the treachery of his brother, whom he had entrusted with the regency of Egypt during his absence. The happy escape of the king and four of his children, for two were burnt, was ascribed to Hephæstus, the great god of Memphis, and the king afterwards dedicated in his temple of that city statues of his wife and himself, each 30 cubits high, and statues of his children, each 20 cubits high; and each of these statues was made of one solid block of stone. (Herod., ii., 107 and 110; Diod., i. 57.) After he had punished his brother, he adorned the temples of the gods with magnificent presents, and rewarded his warriors according to their desert. At this time Egypt was in a state of the highest prosperity, and the inhabitants enjoyed a kind of golden age. The king himself however continued in his restless activity. In each town of Egypt he raised a temple to the greatest local divinity. But in the execution of these, as well as his other great works, he did not employ his Egyptians, but the prisoners of war whom he had brought with him to Egypt. The Babylonian captives, unable to endure the hardships imposed upon them, gathered together and took possession of a fortified place on the Nile, from whence they carried on a war with the Egyptians: at last however the Babylonians were not only pardoned, but received the place which they occupied as their settlement, and henceforth they called it Babylon. Sesostris surrounded many cities of his kingdom with high mounds to protect them against the inundations of the Nile, and many traces of such mounds are still visible (*Egypt. Ant.*, i., p. 45); he also intersected Egypt north of Memphis with numerous canals, which carried off the superfluous water of the Nile, facilitated the intercourse of his subjects, and were a protection against foreign invaders. Another protection of Egypt, especially against the Syrians and Arabs was a wall, 1500 stadia in length (according to Diodor., i. 57), which extended from Pelusium to Heliopolis; but the actual distance is only about seventy-five geographical miles in a straight line, and modern travellers have found that the wall runs past Heliopolis. To the principal divinity of the city of Thebes Sesostris dedicated a magnificent ship of cedar-wood, 280 yards long. The last of his great works were two obelisks of hard stone, each 120 cubits high, on which he recorded the greatness of his power, the amount of tribute which he received, and the number of conquered nations. In the reign of Augustus an obelisk 116 feet high, and said to have been erected under Sesostris, was conveyed to Rome and set up in the Campus Martius. (Plin., *Hist. Nat.*, xxxvi. 14.)

All the subject kings and princes appeared every year at stated times in Egypt before Sesostris with presents, and he travelled with them in a sort of triumph through his country. On all other occasions he treated them with great respect, but when they approached a temple or a city, he made them, four at a time, draw his chariot. (Diod., i. 58; Plin., *Hist. Nat.*, xxxiii. 15.) After Sesostris had reigned 33 years, or, according to Manetho, 66 years, he was seized with blindness, and put an end to his life. (Compare Wilkinson's *Manners and Customs of the Antient Egyptians*, i., p. 63, &c. and 99, &c., who places the epoch of Sesostris about the year 1355 B.C.)

SESQUIALTER, the name of a stop on the organ, containing three ranks of pipes, thus giving three pipes to each organ key, which are tuned in different but harmonic intervals. Sometimes the *Mixture* stop is considered as part of the Sesquialter, in which case the latter is said to contain five ranks of pipes, all tuned in harmonic intervals.

SESSA. [LAVORO, TERRA DI.]

SESSION, KIRK, is the lowest judicatory in the system of the Church of Scotland, having jurisdiction only over a single parish. There is, or ought to be, a kirk session in every parish, composed of the minister, who is *ex-officio* moderator or chairman, and of the lay elders, who must be at the least two in number. The moderator, as in all the other Scottish church courts, has only a casting vote. Meetings of the kirk session may be called at any time by the minister; but they are commonly held at stated intervals, such as once a week or once a fortnight. It is not unusual for the session to meet on the Sunday after divine service. It would rather appear from the 'First Book of Discipline' (eighth head), that the nomination or election of elders was originally in the congregation; but the modern practice is for the session to supply vacancies in, and to make additions to, its number by its own selection, only submitting the names to the congregation, that any legal objections may be made and inquired into by it; and in cases where there happens to be no session in existence, one is appointed by the presbytery. In some of the largest town parishes there are as many as fifty or sixty elders; but in most cases the number does not exceed five or six. In country parishes the elders, or at least those of them who do the duties of the office, are commonly respectable tradesmen, shopkeepers, or mechanics, although persons of higher station occasionally get themselves appointed, principally with a view to qualifying themselves for seats in the General Assembly or the other church courts. The law however is, that an elder must be resident in the parish at least six weeks in the year. He is elected for life, or so long as he remains qualified to hold the office. Every kirk session is represented by an elder both in the presbytery and the synod; the same member being deputed to both courts, and holding his commission for six months. The elders sent to the Assembly, like the other members of that supreme court (except the representatives of the royal burghs and the universities), are nominated by the presbytery. The kirk session may be regarded as the council of the minister, who, strictly speaking, is scarcely authorized to perform any act in the administration of the spiritual affairs of the parish, beyond officiating in the services of religion, without the concurrence of his elders. In practice however the clergyman very rarely encounters any opposition in the kirk session. The ordinary business of the session is to exercise spiritual discipline within the parish, by inquiring into scandals, and punishing delinquencies, which is done by suspension from the benefit of church ordinances, by public or private rebuke, and by pecuniary fines (exacted of course, like submission to the other penalties, only as the price of restoration to communion with the church, for the session has no power to force any person even to appear on its summons). The evidence in all cases that come before the session (at least after the inquiry has fairly commenced) is taken upon oath, and is, or ought to be, carefully recorded by the session-clerk, who is a paid officer, not necessarily a member of the court. There is in most cases an appeal from the judgment of the kirk session to the presbytery; and some graver offences can only be tried by the presbytery even in the first instance. The distribution of the ordinary collections made at the church door for the support of the poor, is also in the hands of the kirk session; and the management of all other funds and assessments allotted to the same purpose is conjointly in that body and in the heritors or landed proprietors of the parish. Indeed the heritors are also by law entitled to a voice, although the right is seldom exercised, even in regard to the management of the weekly collections at the church door. In royal burghs the management of the poor is vested solely in the magistrates; but they usually devolve the greater part of the business upon the kirk session.

(Principal Hill's *View of the Constitution of the Church of Scotland*; Dr. Alexander Hill's *Practice in the several Judicatories of the Church of Scotland*; Dunlop's *Treatise on the Law of Scotland relative to the Poor*; *Report, with Minutes of Evidence, from Select Committee of the House of Commons on Church Patronage, Scotland*, 1834.)

SESSIONS. A session is the period during which any court of law sits for the transaction of judicial business; but the term Sessions is commonly used to denote the meeting of the justices of a county, or other district which has a separate commission of the peace, for the execution of the authorities conferred by the crown by that commission and others created by act of parliament.

County Sessions.—The commission of the peace issued by the crown for the purpose of creating county magistrates, consists of two branches. The former, relating to the powers to be exercised by justices individually and separately, has been already set forth. [JUSTICES.] The second branch of the commission creates the powers of the justices when assembled in sessions. It is as follows:—'We have also assigned you, and every two or more of you (of whom any one of you, the aforesaid A. B., C. D., E. F., &c. we will shall be one), our justices, to inquire the truth more fully, by the oath of good and lawful men of the aforesaid county, by whom the truth of the matter shall be better known, of all and all manner of felonies, poisonings, inchantments, sorceries, arts magic, trespasses, forestallings, regratings, ingrossings, and extortions whatsoever, and of all and singular other crimes and offences, of which the justices of our peace may or ought lawfully to inquire, by whomsoever, and after what manner soever, in the said county done or perpetrated, or which shall happen to be there done or attempted, and also of all those who in the aforesaid county in companies against our peace, in disturbance of our people, with armed force, have gone or rode, or hereafter shall presume to go or ride, and also of all those who have there lain in wait, or hereafter shall presume to lie in wait, to maim, or cut, or kill our people; and also of all victuallers, and all and singular other persons, who in the abuse of weights or measures, or in selling victuals, against the form of the ordinances and statutes, or any one of them, heretofore made for the common benefit of England, and our people thereof, have offended or attempted, or hereafter shall presume in the said county to offend or attempt, and also of all sheriffs, bailiffs, stewards, constables, keepers of gaols, and other officers, who in the execution of their offices about the premises or any of them, have unduly behaved themselves, or hereafter shall presume to behave themselves unduly, or have been or shall happen hereafter to be careless, remiss, or negligent in our aforesaid county and of all and singular articles and circumstances, and all other things whatsoever, that concern the premises, or any of them, by whomsoever, and after what manner soever in our aforesaid county, done or perpetrated, or which hereafter shall there happen to be done or attempted, in what manner soever; and to inspect all indictments whatsoever so before you or any of you taken or to be taken, or before others late our justices of the peace in the aforesaid county made or taken, and not yet determined; and to make and continue processes thereupon against all and singular the persons so indicted, or who before you hereafter shall happen to be indicted, until they can be taken, surrender themselves, or be outlawed; and to hear and determine all and singular the felonies, poisonings, inchantments, sorceries, arts magic, trespasses, forestallings, regratings, ingrossings, extortions, unlawful assemblies, indictments aforesaid, and all and singular other the premises, according to the laws and statutes of England as in the like case it has been accustomed, or ought, to be done; and the same offenders and every of them, for their offences, by fines, ransoms, amerciaments, forfeitures, and other means, as according to the law and custom of England, or form of the ordinances and statutes aforesaid, it has been accustomed, or ought, to be done, to chastise and punish.

'Provided always, that if a case of difficulty upon the determination of any of the premises, before you, or any two or more of you, shall happen to arise, then let judgment in no wise be given thereon before you or any two or more of you, unless in the presence of one of our justices of the one or other bench, or of one of our justices appointed to hold the assizes in the aforesaid county.

'And therefore we command you, and every of you, that to keeping the peace, ordinances, statutes, and all and singular other the premises, you diligently apply yourselves; and that at certain days and places which you, or any such two or more of you as is aforesaid, shall appoint for these purposes, into the premises ye make inquiry, and all and singular the premises hear and determine, and perform and fulfil them in the aforesaid form, doing therein what to justice appertains, according to the law and custom of England, saving to us the amerciaments and other things to us therefrom belonging.

'And we command, by the tenor of these presents, our sheriff of ——— that at certain days and places, which you, or any such two or more of you as is aforesaid, shall make known to him, he cause to come before you, or such two or more of you as aforesaid, so many and such good and lawful men of his bailiwick (as well within liberties as without) by whom the truth of the matter in the premises shall be the better known and inquired into.

'Lastly, we have assigned to you the aforesaid A. B., keeper of the rolls of our peace in our said county: and therefore you shall cause to be brought before you and your said fellows, at the days and places aforesaid, the writs, precepts, processes, and indictments aforesaid, that they may be inspected, and by a due course determined as is aforesaid.

'In witness whereof we have caused these our letters patent to be made. Witness ourself, at Westminster,' &c.

The words 'of whom any one of you the aforesaid A. B., C. D., E. F., &c. we will shall be one,' constitute the quorum clause, so called because when the commission was in Latin, the clause ran '*quorum* A. B. vel C. D. vel E. F., &c. unum esse volumus.'

The statute 1 Mary, sess. 2, c. 8, s. 2, prohibits sheriffs from exercising the office of justice of the peace during the time that they act as sheriffs. They might otherwise be called upon to act in the same matter both as judges and officers,—to execute, as sheriffs, precepts which they had issued as justices. It has been supposed that where a justice is elected coroner, he is discharged of his authority of justice. But if he be created a duke, archbishop, marquess, earl, viscount, baron, bishop, knight, judge, or serjeant at-law, his authority as justice of the peace remains. (1 Edw. VI., c. 7.) By 5 Geo. II., c. 18, s. 2, attorneys, solicitors, and proctors are prohibited from acting as justices of the peace for any county during the time that they continue in practice.

A meeting of the justices held for the purpose of acting judicially for the whole district comprised within their commission constitutes a court of general session of the peace. By 12 Rich. II., c. 10, sessions are required to be held in every quarter of the year, or oftener if need be. The four sessions so held are styled courts of general quarter-session of the peace, or, in common parlance, 'quarter-sessions.' By different statutes the quarter-sessions are directed to be held at uniform periods. The times at which they are directed to be held are, the first week after the 11th of October, the first week after the 28th of December, the first week after the 31st of March, the first week after the 24th of June. Though the justices act irregularly in omitting to convene the quarter-sessions at the prescribed periods (except the April sessions, in respect of which power is expressly given to the justices to alter the time to any day between the 7th of March and the 22nd of April), sessions held as quarter-sessions in other periods of the quarter are legal quarter-sessions. When the business to be transacted at a court of quarter-sessions is not completed before the time at which it is thought desirable for the justices to separate, the court is usually adjourned to a subsequent day; so where there is reason to expect that new matters will arise which it will be desirable to dispose of before the next quarter-sessions. Two justices, one of them being of the quorum, may at any time convene a general session of the peace; but at such additional session no business can be transacted which is directed by any act of parliament to be transacted at quarter sessions.

Both general sessions and general quarter-sessions are held by virtue of a precept under the hands of two justices, requiring the sheriff to return a grand jury before them and their fellow-justices at a day certain, not less than fifteen days after the date of the precept, at a certain place within the district to which the commission extends, and to summon all coroners, keepers of gaols and houses of correction, high constables, and bailiffs of liberties [FRANCHISE] within the county.

Persons bound to attend at the sessions are:—First, all justices of the peace for the county or district. Secondly, the custos rotulorum of the county, who is bound to attend by himself or his deputy, with the rolls of the sessions. Thirdly, the sheriff by himself or his under-sheriff, to return the precept and lists of persons liable to serve on the grand or petty jury, to execute process, &c. Fourthly, the several coroners of the county or district. Fifthly, the constables of hundreds or high constables. Sixthly, all bailiffs of hundreds and liberties. Seventhly, the keepers of gaols, to bring and receive prisoners. Eighthly, the keeper of the house of correction, to give in a calendar and account of persons in his custody. Ninthly, all persons returned by the sheriff as jurors. Tenthly, all persons who have entered into a recognizance to answer charges to be made against them, or to prosecute or give evidence upon charges against others.

Persons summoned on grand or petty juries ought to be males between 21 and 60 years of age, who are possessed of 10*l.* a year in lands or rents, or 20*l.* a year in leaseholds for an unexpired term or terms of 21 years or more, or who are householders, rated to the poor on a value of not less than 20*l.* (in Middlesex 30*l.*) or who occupy houses containing not less than fifteen windows, and who are not peers, judges of the superior courts, clergymen, Roman Catholic priests, dissenting ministers following no secular employment but that of schoolmasters, serjeants, or barristers-at-law, doctors or advocates of civil law actually practising, officers of courts actually exercising the duties of their respective offices, coroners, gaolers or keepers of houses of correction, members or licentiates of the college of physicians actually practising, members of the royal colleges of surgeons in London, Edinburgh, or Dublin, and actually practising, certificated apothecaries actually practising, officers in the army or navy in full pay, pilots licensed by the Trinity House, masters of vessels in the Buoy and Light service, pilots licensed by the lord warden of the Cinque Ports or under any act of parliament or charter, household servants of the crown, officers of the customs or excise, sheriffs' officers, high constables, or parish clerks.

The justices in sessions have criminal jurisdiction, to be exercised partly according to the rules of common law and partly in a course prescribed by different acts of parliament; they have also jurisdiction in certain civil matters created by different statutes; they have an administrative power in certain county matters; and they have power to fine and imprison for contempt.

I. The criminal jurisdiction of justices in sessions, according to the course of common law, enables them to try felonies and those misdemeanors which are not directed by any statute to be tried in a summary way. It has been said that they have no jurisdiction in cases of perjury and forgery; but this opinion seems to have arisen from the circumstance that at common law these crimes were only misdemeanors, and the authority of the justices extended only to such misdemeanors as were specially mentioned in their commission, or which came within the description of trespasses; and though most species of forgery have since been made felony, the opinion that courts of quarter-sessions have no jurisdiction in cases of forgery is still commonly entertained.

The jurisdiction given by the commission of the peace, in respect of felonies, is expressed in very general terms, and in former times numerous executions for felony took place at the quarter-sessions. The practice during the present and the greater part of the last century has been however not to try at the sessions persons charged with capital crimes, but to leave them for trial by the judges at the assizes.

Previously to the 6 and 7 Will. IV., c. 114, it was in the discretion of the magistrate before whom the depositions were taken, whether he would allow them to be inspected; even the party accused had no right to demand a copy of the depositions, though in cases of treason or felony he was entitled to demand a list containing the names of the witnesses for the prosecution. But by that act (s. 3) 'all persons held to bail or committed to prison for any offence, are authorised to require and have, on demand, from the person who has the lawful custody thereof, copies of the examinations of the witnesses respectively upon whose depositions they were held to bail or committed to prison, on payment of a reasonable sum for the same, not exceeding three-halfpence for each folio of ninety words; subject to a proviso, that if such demand be not made before the day appointed for the commencement of the sessions at which the trial of the person on whose behalf such demand is made is to take place, such person is not to be entitled to have any copy of such examination of witnesses, unless the person to preside at such trial be of opinion that such copy may be made and delivered without delay or inconvenience to such trial. The chairman is however authorised to postpone the trial on account of such copy of the examination of witnesses not having been previously had by the party charged:' and by sec. 5, all persons under trial are authorised, at the time of their trial, to inspect, without fee or reward, all depositions (or copies thereof) which have been taken against them, and returned into the court before which such trial is had.

A prisoner or defendant, charged with a felony or a misdemeanor, cannot have the assistance of counsel to examine the witnesses, and reserve to himself the right of addressing the jury. But if he conduct his defence himself, and any point of law arises which he professes himself unable to argue, the court will hear it argued by counsel on his behalf.

II. The quarter-sessions have an original jurisdiction in all matters required to be done by two or more justices, except in cases in which a power is given of appealing to the sessions.

III. Statutes which give summary jurisdiction to one or more magistrates, in most cases allow their decision to be brought before the sessions by way of appeal. Notice of appeal is generally required, and the court is precluded from entertaining any objections not specified in the notice. Subject to this restriction, the case is heard as if the question were raised for the first time. Upon the hearing of an appeal in which several counsel are employed, the course of practice usually is this:—the senior counsel for the respondent (the party resisting the appeal) states his case in accordance with the decision appealed against. The witnesses and documents in support of that case having been produced and examined, the second counsel for the respondent addresses the court, and remarks upon the evidence which has been given. The senior counsel for the appellant then addresses the court; and if no evidence is produced on the part of the appellant, the case is closed, and the order, conviction, or other matter appealed against is confirmed or discharged, according to the view which the majority of the justices present at the moment of the decision take of the case, they being the judges in cases of appeal, both as to the law and the fact. Where however questions of difficulty in matter of law present themselves upon the hearing of an appeal, the party against whom the sessions decide frequently applies for leave to state a special case for the decision of the court of King's Bench: the majority of the justices may either grant or reject the application; and if no special case be stated, the judgment of the quarter-sessions upon an appeal, or upon any other matter in which they proceed in a course prescribed by statute, different from the course of the common law, cannot be reviewed by any other court. Where the quarter-sessions act as a court of criminal jurisdiction under the powers given by the commission, and according to the course of common law, a writ of error lies upon the judgment of the sessions to the court of King's Bench, and from that court to the Exchequer Chamber, and ultimately to the House of Lords.

IV. The quarter-sessions have jurisdiction over the appropriation of the county stock, an annual fund raised principally by county rates. This part of the business of the court is usually disposed of before any other, and in practice the first day of the sessions is exclusively devoted to what is called 'the county business.'

V. In common with other courts of record, justices of the peace, whether assembled in sessions, or sitting as individual magistrates, may vindicate their authority by fining and imprisoning for contempt. No superior court can inquire into the existence or non-existence of the fact which has been so treated as a contempt, or into the reasonableness of the fine imposed or imprisonment awarded. The court of quarter-sessions has however no power of punishing contempts or other offences committed by one of their own body.

The justices being assembled in sessions elect a chairman. A panel, or list of persons returned to serve on the grand-jury, being called over, twenty-three, if so many appear, are sworn to inquire of the truth of the matters which will be brought before them, and not to disclose what is brought before them. If twenty-three do not appear, the court may proceed with a smaller number; but nothing can be done by the grand-jury without the concurrence of twelve of its members, and it is not usual to take less than thirteen, though twelve may be sworn, if, after waiting a reasonable time, more do not attend. Those persons in the panel who do not answer to their names are liable to be fined; and where it is thought desirable to ensure full attendance in future, the whole panel is called over for the purpose of discovering and punishing all the defaulters. The grand-jury being sworn, the royal proclamation against vice and immorality is read by the clerk of the peace. The chairman delivers his charge to the grand jury, in which, as he is in possession of the depositions taken when the prisoners were committed, he calls their attention to such cases as appear to present any difficulty, and explains such points of law as are necessary for their guidance. The grand-jury then retire to their room to receive such bills of indictment as may be brought before them.

When the business of the sessions is such as to be likely to occupy one court more than three days, it is usual to appoint a second chairman to preside in a separate court, under the authority of 59 Geo. III., c. 28. The bills of indictment for offences to be prosecuted at the sessions being prepared, the witnesses in support of the charge are sworn in court. The bills of indictment on parchment, with the names of the witnesses indorsed thereon, are taken to the grand-jury, who call in and examine the witnesses in succession, no other person being present. The examination being concluded, if a majority consisting of not less than twelve are of opinion that the charge is supported by the evidence, the bill of indictment is indorsed 'a true bill,' or the indorsement may state that the bill is true in such and such parts, and not true in others, or the grand-jury may themselves strike out or alter any part of the bill, and return it in its corrected form as a true bill generally. If a majority of the grand-jury think that the party is not guilty, or if the number that think him guilty be less than twelve, they indorse 'not a true bill;' though in the latter case the old form of indorsement, 'ignoramus' (we do not know), seems to be more correct. It not unfrequently happens that grand-jurors return 'a true bill' where the evidence which has been brought before them is such as merely to raise in their minds a strong suspicion of the guilt of the party accused, acting under an impression that it is not their duty to try the guilt of the party, and that the inquiry which has taken place in the grand-jury room is in the nature of a precognition little differing from the preliminary examination which takes place before a magistrate, who is bound to commit or to require bail if a probable cause of guilt be made out. By the common law of England, a man is not liable to punishment until the fact charged against him has been found to be true by the oath of twelve men (whether grand-jurors, leet-jurors, or jurors impanelled to try an issue in a civil cause involving a charge of crime), nor until such finding has been afterwards confirmed by the verdict of twelve others, forming the petty-jury, or by the confession of the party by pleading guilty in open court. The judgment of the court ought in strictness perhaps to be considered as founded upon the presentment of the grand-jury, and the proceedings which take place before the petty-jury may be said to be less a trial of the guilt or innocence of the prisoner than a trial of the truth or falsehood of the indictment. The grand-jury are sworn to inquire, not whether the accused ought to be put upon his trial, but whether the matter in respect of which they are to make their presentment, contained in the bill of indictment, which directly and unequivocally asserts that a crime has been committed by the party, is or is not true. To return a bill as true upon less evidence than that which, if uncontradicted, would be satisfactory proof of guilt, seems to be at variance with an oath to present the whole truth and nothing but the truth. There appears to be no substantial distinction between a finding by the grand-jury that the party has committed the offence charged, and a verdict of 'guilty' pronounced by a petty-jury. The finding of a true bill where the evidence is not sufficient to convict, is a wrong to the party accused. On the other hand, the justice of the country is not unfrequently defeated by forcing on a criminal charge to its final decision at a time when evidence sufficient to show the real character of the transaction has not been obtained; and by the inconsiderate haste of grand-juries in finding bills, the most atrocious crimes have not unfrequently obtained a total exemption from punishment. (8 Howell, *State Trials*, 821, 836, 838; Burn's *Justice*, 'Indictment V.')

The bill, being indorsed, is brought into court by the grand-jury, and delivered to the clerk of the peace, who reads the indorsement with the name of the prisoner and the nature of the charge. By finding the bill to be true, either generally or in part, the grand-jury are become indictors, and the party charged the indictee; but these terms are nearly obsolete. The indictee is brought to the bar by the gaoler if in custody, or if out on bail, he comes of his own accord in discharge of his bail. He is then arraigned, and the trial proceeds in the same manner as at the assizes. [Trial.] If the prisoner be found not guilty, he is immediately set at liberty, unless there be some other matter before the court upon which he ought to be detained. If a verdict of guilty be returned, the sentence is pronounced by the chairman, such sentence, where the amount of punishment attached to the offence is not fixed, being first determined by the opinion of the majority of the justices present.

The sessions cannot be held without the presence of two justices at least; nor can they be adjourned by one justice, though two or more may previously have been present. Every act done as an act of sessions, before two justices have met, or after two have ceased to be present, is void.

The crown may grant a commission of the peace not only for an entire county, but also for a particular district within the county. In order however to exclude the interference of the county justices in the particular district, it is necessary either to introduce into the commission of the peace for the particular district a clause excluding the jurisdiction of the county magistrates, which is called a neintromittant clause, or to grant a new commission to the county magistrates excluding the particular district. If the former, which is the usual course, be taken, the county magistrates may still hold their sessions within the particular district, though they can exercise no jurisdiction in respect of matters arising within the district.

Petty and Special Sessions.—A meeting held by justices for the transaction of magisterial business arising within a particular district forming a subdivision of the county or district comprised in the commission of the peace, is called a petty session; and if the meeting be convened for some particular or special object, as the appointment of overseers of the poor, of waywardens, of examiners of weights and measures, &c., it is called a special session. A meeting of magistrates cannot legally act as a special session, unless all the magistrates of the particular division are present, or have had reasonable notice to attend.

Borough Sessions.—The Municipal Corporation Act (5 & 6 Wm. IV., c. 76) directs that the recorder of any city or borough to which a separate court of quarter-sessions is granted under the provisions of that act, shall be the sole judge of such court [Recorder], leaving the ordinary duties of magistrates out of sessions to be performed by the justices of the peace appointed by the crown for such city or borough. The recorder is required to hold a court of quarter-sessions once in every quarter of a year, or at such other and more frequent times as he may think fit, or as the crown may direct. Borough quarter-sessions are not however, like county quarter-sessions, appointed to be held in particular weeks. In case of sickness or unavoidable absence, the recorder is authorised, with the consent of the town council, to appoint a barrister of five years' standing to act as deputy recorder at the next session, but no longer. In the absence of the recorder and of any deputy recorder, the court may be opened and adjourned, and the recognisances respited, by the mayor; but the mayor is not authorised to do any other judicial act. Where it appears to the recorder that the sessions are likely to last more than three days, he may appoint an 'assistant-barrister' of five years' standing to hold a second court, for the trial of such felonies and misdemeanors as shall be referred to him, provided it has been certified to the recorder, by the mayor and two aldermen, that the council have resolved that such a course is expedient, and the name of the intended assistant-barrister has been approved of by a secretary of state.

Every burgess of a borough (or citizen of a city), having a court of quarter-session (unless exempt or disqualified otherwise than in respect of property), is liable to serve on grand and petty juries. Members of the town-council, and the justices of the peace, treasurer, and town-clerk of the borough, are exempt and disqualified from serving on juries within the borough; and they and all burgesses of boroughs having separate quarter-sessions are exempt from liability to serve on petty juries at the county sessions.

Under the 105th section of the Municipal Corporation Act, the recorder has jurisdiction in respect of all crimes cognizable by courts of quarter-session in counties; but he is expressly restricted from making or levying any rate in the nature of a county rate, or granting any licence to keep an inn, &c., and from exercising any of the powers vested in the town-council. Other matters required by statute to be done at quarter-sessions, and not expressly transferred to the town-council, devolve upon the recorder, as the appointment of inspectors of weights and measures, &c. Persons imprisoned in a borough gaol by county magistrates, under 6 and 7 Will. IV., cap. 105, may be tried at the borough sessions for offences committed out of the borough.

All criminal jurisdiction, which, before the passing of the Municipal Corporation Act, existed in any borough to which no court of quarter-sessions has since been granted, is taken away by the 107th section of that act.

SESTE'RTIUS, a Roman coin, which originally consisted of 2½ asses, as the name implies, *sestertius* being a contraction of *semis tertius, the third a-half*, which is the Roman way of expressing *two and a half*. The sestertius belonged both to the brass and silver coinage; and in both it was of the same value, namely, one-fourth of the denarius. This value agreed with its value in asses so long as the denarius consisted of 10 asses. But at an early period the as was reduced in value, and 16 asses made equal to the denarius [As], and then the sestertius, its value with reference to the denarius remaining the same, became of course equal to 4 asses. On Mr. Hussey's computation the value of the denarius after the reduction was 8½*d.* and therefore the sestertius was worth 2⅛*d.* After the time of Augustus the denarius was reduced to the eighth of an ounce, and was worth 7½*d.*, and therefore the sestertius was worth 1⅞*d.* The sestertius of the brass coinage was made of the same metal as the As.

The Romans generally reckoned sums of money in sestertii, although the coin used in making payments was commonly the denarius. Large sums they reckoned by *sestertia*, that is, sums of *a thousand sestertii*. It is very important to attend to the phrases used in such computations. The coin itself was called *sestertius*, or *sestertius nummus*, or simply *nummus*. The sum of a thousand sestertii was expressed by *mile sestertii*, or *M. sestertium*, or *M. nummi*, or *M. nummum* or *nummorum*, or *M. sestertii nummi*, or *M. sestertium nummum*. The singular *sestertium* is never used for a thousand sestertii, but the plural *sestertia* is used for all multiples of a thousand sestertii, up to a thousand; sometimes the word *millia* (thousands) is used instead of *sestertia*; sometimes neither word is expressed; and sometimes *nummum* is added. Thus 600,000 sestertii, or 600 sestertia, might be expressed by any of the following phrases: *sescenta sestertia, sescenta millia, sescenta* alone, or *sescenta sestertia nummum*. Sums of 1000 *sestertia* and upwards were expressed by the numeral adverbs with the termination *ies*, which implies that the number to which it is affixed is to be multiplied by 100. Thus *decies, undecies, duodecies, vicies tricies, tricies, quinquies*, stand respectively for, 1000, 1100, 1200, 2000, 3000, 3500 sestertia. These forms are however sometimes varied. Thus Cicero (*in Verr.*, ii. 1, 39) uses *quaterdecies* for 1400, and *decies et octingenta millia* for 1800 sestertia. When two such adverbs come together, if the larger is first, they must be added together; but if the smaller is first, they must be multiplied. Thus we have in a passage of Suetonius (*Aug.*, 101), *millies et quingenties* for 150,000 sestertia, and immediately afterwards *quaterdecies millies* for 1,400,000 sestertia. (In the latter case, care must be taken not to reckon the termination *ies* twice over in multiplying; it is not 1400 × 100,000, but 14 × 1000 × 100).

The symbol HS or IIS is often used both for *sestertii* and for *sestertia*. It stands for *libra libra semis* (two pounds and a half). When applied to *sestertii* its meaning is clear enough, since the as was originally a pound (*libra*) of brass. When applied to *sestertia* it meant, according to Gronovius (*Pec. Vet.*, i. 4, 11), two pounds and a half of silver, which he calculates to have been originally equal to 1000 sestertii, and therefore to have represented that value ever after. It is often difficult to determine whether the symbol HS stands for *sestertii* or *sestertia*. When the numeral is written in cypher, and has a line over it, it stands for the adverb in *ies*, and the HS means *sestertia*: thus, HS. $\overline{\text{CCCC}}$ is *quadringenties*, or forty thousand *sestertia*. Sometimes the numeral is found with the singular of *sestertium*, as *sestertii decies*, or *sestertio decies*. Gronovius explains these forms, and also the use of *sestertium* with the adverb in *ies* (which he considers to be, in this case, an accusative singular), by understanding with them the word *pondus*, a pound (of silver), according to which *sestertium* in these forms means two pounds and a half of silver, or 1000 sestertii. Hence if these forms are used with a numeral in cypher, they mean the number of *sestertia* represented by the adverb in *ies* of that numeral. Thus *sestertio X* is *decies* or 1000 *sestertia*.

According to the value given above for the *sestertius*, the *sestertium* was worth 8*l.* 17*s.* 1*d.*

The word *sestertius* is often used indefinitely for any very small sum. (Hussey *On the Antient Weights and Money*, c. x., § 1, 3, 6.)

SESTI'NI, DOME'NICO, born at Florence about 1750, studied classical literature, and applied himself chiefly to archæology. About 1774 he went to Sicily, where the Prince of Biscari retained him for his librarian and keeper of his rich cabinet of antiquities at Catania. In 1778 Sestini proceeded to Constantinople, where he became tutor to the sons of Count Ludolfi, the Neapolitan ambassador at the Porte. He made several journeys with his pupils through various provinces of the Ottoman empire. He was afterwards employed by Sir Robert Ainslie, the English ambassador at the Porte, to collect medals for him. Subsequently he went with Mr. Sullivan as far as Bushir, and returned to Constantinople in 1782. The published narratives of his journeys are:—1, 'Lettere scritte dalla Sicilia e dalla Turchia à diversi amici in Toscana,' 7 vols., 12mo., translated into French at Paris in 1809; 2, 'Lettere Odeporiche,' 1785, translated into French under the title of 'Voyage dans la Grece Asiatique, à la Péninsule de Cyzique, à Brusse et à Nicée,' with a Flora of Mount Olympus, Paris, 1789; 3, 'Viaggio da Costantinopoli à Bucharest,' Rome, 1794,; 4, 'Viaggio da Costantinopoli à Bassora e ritorno,' also translated into French; 5, 'Viaggi ed Opuscoli Diversi,' 8vo., Berlin, 1807. This work contains the account of a journey made by the author in 1781, from Vienna to Rukschuk by the Danube, and from thence by Varna to Constantinople; an account of the sect of the Yezidis, which was afterwards inserted by Sylvestre de Sacy, in his 'Description du Pachalik de Bagdad;' a treatise on the 'murex' of the antients, &c.; 6, Viaggio Curioso, Scientifico, Antiquario, per la Valachia, Transilvania, ed Ungheria sino à Vienna,' Florence, 1815; 7, 'Agricoltura Prodotti e Commercio della Sicilia,' of which only one volume was published, at Florence, 1777.

From Constantinople Sestini returned to Italy, where he published several of his works. He sailed again for the Levant in 1793, and went to Salonichi, where he became acquainted with Cousinery, the French consul and antiquarian; he thence returned to Tuscany, and from Tuscany to Germany. He resided many years at Berlin, which he left after the battle of Jena. He then repaired to Paris, and in 1810 he returned to Florence, where he was appointed antiquarian to the grand-duchess Elise, Napoleon's sister. After the restoration in 1814 he was appointed by the grand-duke Ferdinand honorary professor in the university of Pisa. He afterwards repaired to Hungary, where he remained some time occupied in arranging the rich collection of medals of Count Wiczay at Hederwar, of which Father Caronni, a Barnabite and an antiquarian, who went over part of the same ground as Sestini, but was inferior to him in judgment and experience, had published an imperfect catalogue in 1812. The present grand-duke of Tuscany, Leopold II., appointed Sestini to the office of royal antiquarian, and after his death, which took place at Florence in 1832, he purchased his valuable library and numerous MSS., among the rest his great work on numismatics, 'Sistema Numismatico,' 14 vols. fol.

Among the published works of Sestini on his favourite science of numismatics, which he illustrated by means of geography, and *vice versâ*, the following deserve especial mention:—1, 'Classes generales Geographiæ Numismaticæ, seu Monetæ Urbium, Populorum, et Regum, ordine geographico et chronologico dispositæ secundum systema Eckelianum,' 4to., Leipzig, 1797, a work more complete than those of Eckel, Lipsius, and Pinkerton. In the first part Sestini gives a series of medals of more than a 1000 cities, and of 240 sovereigns; and in the second is a list of cities to which Goltz and Ligorio have attributed apocryphal medals, and of many more to which medals have been erroneously distributed and misapplied; 2, 'Considerazioni sulla Confederazione degli Achei,' with plates of all the medals of the confederate cities; 3, 'Relazione su i Moderni Falsificatori,' in which he exposes the tricks of those who coin medals which they pass for antient; 4, 'Descriptio Nummorum Veterum ex Museis Ainslie, Bellini, Bonducca, Borgia, Casoli, Cousinéry, Gradenigo, San Clemente, von Schellersheim, Verità,' &c., fol., Leipzig, 1796; 5, 'Descrizione degli Stateri Antichi, illustrati colle Medaglie,' 4to., Florence, 1817; 6, 'Lettere Numismatiche,' 9 vols., published at different periods, and containing many valuable dissertations, such as upon Armenian coins, upon the æra of the Arsacidæ, upon a rare set of medals of Ptolemy, son of Juba II., upon a medal of Aëropus III., king of Macedonia, &c; 7, 'Descrizione di alcune Medaglie Greche del Museo Fontana,' 3 vols. 4to., Florence, 1822-9; 8, 'Descrizione di alcune Medaglie Greche del Museo del Barone di Chaudoir,' 4to., 1831; 9, 'Catalogus Nummorum Veterum Musei Arigoniani, dispositus secundum sistema geographicum,' fol.; 10, 'Descrizione delle Medaglie Greche e Romane del fù Benkowitz;' 11, 'Illustrazione d'un Vaso di Vetro con edifizi e leggende;' the vase was found at Populonia near Piombino; 12, 'Dissertazione intorno al Virgilio di Aproniano, codice prezioso della Laurenziana;' this is an account of a MS. copy of Virgil on parchment, which exists in the Laurentian or Medici library at Florence, written by a certain Apronianus, who is supposed to be Turcius Rufius Asterius Apronianus, who was consul A.D. 494; 14, 'A Catalogue, with illustrations, of the valuable Museum Hederwar in Hungary,' in 3 vols.

Sestini ranks among the first numismatists of any age or country. He was in correspondence with the most learned of his contemporaries, and was intimate with Eckel, Neuman, Cardinal Borgia, Cousinery, and others; and was member of the academies of Paris, Petersburg, Munich, &c. (*Necrologia di Domenico Sestini*, in the *Antologia* of Florence, July, 1832.)

SESTOS (Σηστός), the chief city of the Thracian Chersonesus, was situated on the Hellespont. In very remote times it was under the same government as Abydos, which was on the opposite Asiatic coast. [ABYDOS.] Theopompus says that Sestos was a small but well fortified town, which was connected with the port by a wall (σκέλος) of two hundred feet, in length apparently; and that, owing to its position, and the current from the Propontis, it commanded the channel. At the close of the great Persian war, some Persians under Oeobazus and Artayctes took refuge in Sestos on hearing of the approach of the Greeks towards the Hellespont. The town was besieged by the Athenians, and the inhabitants, after being reduced to the greatest straits by famine, opened the gates. Artayctes, who had escaped from the city before the surrender, was caught and crucified. The capture of Sestos (B.C. 479) terminated this great campaign, which was signalized by the victories of Salamis, Plataea, and Mycale; and with this event the history of Herodotus closes. (Strabo, p. 591; Herod., ix. 121; Thucyd., i. 89.)

SESTRI. [SPEZIA.]

SESTRI DI LEVANTE. [CHIAVARI.]

SESTRI DI PONENTE. [GENOA.]

SET-OFF, in Law, is the amount of the debt due to a defendant from a plaintiff, which the defendant is entitled to set off in answer either to the whole or part, as the case may be, of the plaintiff's demand. At common law, if the plaintiff was indebted to the defendant in an ascertained sum in respect of the same transaction concerning which the action was brought, the defendant was entitled to deduct at the trial so much from the plaintiff's demand. But if the debt due from the plaintiff accrued in respect of another transaction, the defendant had no such power; and he was either compelled to bring an action against the plaintiff for what was due to him, or, if he wished to avail himself of his cross-demand without bringing another action, to apply after the action had been commenced against him to a court of equity for the purpose of adjusting the claims of himself and the plaintiff. To obviate the expense and inconvenience of such a course, it was enacted by 2 Geo. II., c. 22, s. 13, that 'where there are mutual debts between the plaintiff and defendant, or if either party sue or be sued as executor or administrator, where there are mutual debts between the testator or intestate and either party, one debt may be set against the other; and such matter may be given in evidence upon the general issue, or pleaded in bar, as the nature of the case shall require, so as at the time of pleading the general issue, where any such debt of the plaintiff, his testator or intestate, is intended to be insisted on in evidence, notice shall be given of the particular sum or debt so intended to be insisted on, and upon what account it became due; or otherwise such matter shall not be allowed in evidence upon the general issue.' To remove the doubts which existed whether under this statute debts of a different nature could be set off against each other, it was afterwards, by the statute 8 Geo. II. c. 24, s. 4, enacted and declared, 'that by virtue of the said clause mutual debts may be set off against each other, either by being pleaded in bar or given in evidence on the general issue in the manner therein mentioned, notwithstanding that such debts are deemed in law to be of a different nature; unless in cases where either of the said debts shall accrue by reason of a penalty contained in any bond or specialty; and in all cases where either the debt for which the action has been or shall be brought, or the debt intended to be set against the same hath accrued or shall accrue by reason of any such penalty, the debt intended to be set off shall be pleaded in bar; in which case plea shall be shown how much is truly and justly due on either side; and in case the plaintiff shall recover in any such action or suit, judgment shall be entered for no more than shall appear to be truly and justly due to him, after one debt being set off against the other as aforesaid.'

Upon these enactments is founded the whole law on the subject, and the defendant may avail himself of his set off in actions of debt, covenant, and assumpsit for the non-payment of money, provided the subject-matter of the set off is a liquidated, that is, an ascertained sum, due and recoverable at the time of the commencement of the action, and might have been the subject of any one of the kind of actions above named. A claim for damages not ascertained cannot be set off, even although they relate to the subject-matter of the action itself. For instance, in an action for goods delivered, the defendant cannot set off the loss which he has suffered by their non-delivery at the proper time, &c. There must also be an entire mutuality between the debt sued for and the set off. Thus a debt due from the plaintiff together with other parties cannot be set off against a debt due to the plaintiff alone; nor can a debt due to the defendant personally be set off to a demand against him as executor, &c.: and the rule of law is the same for the converse of these cases. It is consistent with this rule that when an action is brought by or against a trustee, a set off may be made of money due to or from the party for whom he is trustee.

A plea of set off must describe the debt intended to be set off with the same certainty and particularity as would be necessary in a declaration, which indeed such a plea in several respects much resembles. If for instance a plea of set off contains several parts stating distinct debts, these are analogous to distinct counts in a declaration, and one may be sustained although the others may not. The same degree of certainty has been required in a notice of set off. But by a general rule of Hilary term, 4 Will. IV., which orders that 'set off and mutual credit must be pleaded,' it should seem that notice of set off is now abolished. (Montagu on *Set Off;* Tidd's *Practice;* Chitty *on Pleading.*)

By the Bankrupt Act (6 Geo. IV., c. 16, s. 50) it is enacted 'That where there has been mutual credit given by the bankrupt and any other person, or where there are mutual debts between the bankrupt and any other person, the commissioners shall state the account between them, and one debt or demand may be set against another, notwithstanding any prior act of bankruptcy committed by such bankrupt before the credit given or the debt contracted by him; and what shall appear due on either side on the balance of such account, and no more, shall be claimed or paid on either side respectively, and every debt or demand hereby made provable against the estate of the bankrupt, may also be set off in manner aforesaid against such estate; provided that the person claiming the benefit of such set off had not, when such credit was given, notice of an act of bankruptcy by such bankrupt committed. Various questions have arisen under this clause, with respect both to the words 'mutual credit' and 'debt or demand.' The 'debt' must be an ascertained sum at the time of the bankruptcy. If it is a debt arising in respect of some dealings, such as consignments, the amount of which is not ascertained at the time of the bankruptcy, but is ascertained afterwards, such debt is not a 'debt' within the meaning of the act of parliament.

SETA'RIA, a genus of Grasses containing a few species cultivated as corn-grains in some countries. The genus is named from *seta*, a bristle, on account of the bristly nature of the involucrum. The species are found in both the hot and temperate parts of the world. The genus nearly corresponds in character with Panicum, under which it is sometimes included, but it is also combined with Pennisetum. It is characterised by having the spikelets 2-flowered, supported by two or more bristles. The lower valve is the smallest. The lower flower is neuter or male, with the valves of the corol coriaceous and indurated, awnless, the lower one embracing the other, petaloid scales very obtuse and subfalcate. Germen emarginate. Seed included within the persistent glumes.

The species are found both in the hot and temperate parts of the world. Two are indigenous in England, *S. verticellata* and *S. viridis*, and called bristle-grass. The first is found also in India and America; birds are partial to the seed of the latter. *S. Germanica* is cultivated in Hungary as food for horses, and is preferred for this purpose to many other grasses. *S. italica* is cultivated in Italy and other parts of Europe, sometimes called millet (*Panicum Miliaceum*) and employed for the same purposes. It may be distinguished by the name of Italian millet; though it has, no doubt, been introduced from Eastern regions, perhaps from India, where it is extensively cultivated as one of their dry or small grains, and forms an article of diet with the natives. It is called *kora* and *kungnee*, and is the *sumak* of the Arabs. It requires an elevated, light, and tolerably dry soil. It is sown in June and July, and the harvest gathered in September; the produce being about fifty-fold in a favourable season. A second crop may be had from the same ground, between September and the end of January.

SETON. [ISSUE.]

SETTER, the name for that variety of the Dog which partakes of the characters of the POINTER and SPANIEL, *Canis familiaris Index* of Caius.

The setter is less liable to be foot-sore than the pointer; but is generally considered more difficult to break. When however a well broken well-bred setter is hunted frequently, no dog trained to the gun does his work better or is more staunch. The breed originated in all probability between the large English spaniel and the Spanish pointer.

This variety possesses a high degree of intelligence, and is capable of the strongest attachment. Mr. Bell's account of a favourite of this breed is so interesting that we give it in his own words:—

'By far the most interesting, and, if I may so employ the term, amiable animal I have ever known, was a bitch of this kind, formerly belonging to my father, which he had from a puppy, and which, although never regularly broke, was the best dog in the field that he ever possessed. The very expression of poor Juno's countenance was full of sensibility and affection. She appeared to be always on the watch to evince her love and gratitude to those who were kind to her; and the instinct of attachment was in her so powerful, that it showed itself in her conduct to other animals as well as to her human friends. A kitten which had been lately taken from its mother was sent to us, and, on Juno's approach, showed the usual horror of the cat towards dogs. But Juno seemed determined to conquer the antipathy, and, by the most winning and persevering kindness and forbearance, advancing or receding as she found the waywardness of her new friend's temper required, she completely attached the kitten to her; and as she had lately lost her puppies, and still had some milk left, I have often seen them lying together before the fire, the kitten sucking her kind foster-mother, who was licking and caressing her as her own offspring. She would also play with great gentleness with some tame rabbits of mine, and would entice them to familiarity by the kindness of her manner; and so fond was she of caressing the young of her own species, that when a spaniel bitch of my father's had puppies, of which all excepting one were destroyed, Juno would take every opportunity to steal the remaining one from its mother's nest and carry it to her own, where she would lick and fondle it with the greatest tenderness. Poor Busy, the mother, also a good-tempered creature, as soon as she had discovered the theft, hastened of course to bring back her little one, which was again to be stolen on the first favourable opportunity; until at length the two bitches killed the poor puppy between them, as they were endeavouring each to pull it from the other; and all this with the most perfect, mutual, good understanding. Juno lived to a good old age, an unspoiled pet, after her master had shot to her for fourteen seasons.' (*British Quadrupeds*.)

SETTLE. [YORKSHIRE.]

SETTLEMENT. A settlement, in the most general sense of the word, is a disposition of property of any kind made for certain purposes by the owner, who, in relation to such disposition, is called the settlor or grantor. A settlement in this sense may be made either by deed or by will, but the term is most commonly applied to such settlements only as are made by a deed.

A consideration is not necessary for the validity of a deed at law. Though a deed may in many cases be void as against strangers for want of consideration, it is valid as between the parties. [DEED.] Settlements by deed therefore may be either made upon valuable or good consideration, or they may be purely voluntary.

The most important species of settlements, to which indeed, in strict legal language, the term is exclusively applied, are marriage settlements; and these may be either such as are made previous to and in consideration of marriage, or subsequent to it.

Settlements of property are frequently made by will, with reference to an existing or future marriage. The forms and provisions contained in such instruments are of course often very similar to those in deeds made for like purposes. But dispositions of this kind are to be regarded in all respects as wills, and are governed by the same rules as other instruments of the like nature. [WILL.]

Settlements in consideration of marriage include not only such as are actually made and executed before marriage, but also such as are executed after marriage in pursuance of articles in writing drawn up and signed before marriage.

1. First, as to the specific performance of articles and agreements to settle property:—

In Equity no regard is paid to the form of marriage articles, and the construction of them depends entirely upon the intentions and objects of the parties.

When the intended husband and wife are both of full age at the time of the marriage, they are of course competent to enter into any agreement for the settlement of their respective estates, and all such agreements will be enforced in Equity; but if the parties are one or both of them minors at the time, the case is different.

When the husband is adult and the wife a minor, if the subject be real estate of the wife, the husband will be bound by the articles in respect of his marital interest in the lands; that is, for the estate which he takes during the joint lives of himself and his wife, and as tenant by the curtesy if he survive her and there have been issue of the marriage: but the wife will not be bound by them; and, if she die during infancy or after attaining majority, but without having confirmed the settlement in the mode prescribed by the law for disposition of real estate by married women, her heir will take the property unfettered by the articles. Again, if, in the case supposed, the property be personalty of the wife (which, in the absence of a settlement, would become the property of the husband), the articles will be valid as respects both husband and wife, being, in effect, the settlement of the husband. And this is true also as to chattels real and *choses in action* which become reducible into possession during the coverture; but, as to property already settled to the separate use of the wife, and *choses in action* which do not, in event, become reducible into possession during the coverture, the wife will not be bound by the articles.

If a male infant marry an adult female, he is bound by the articles entered into by her for the settlement of her estate, and must execute them when he comes of age, whatever be the nature of the property: but as to his own estate he will not be bound by them.

When the husband and wife are both minors at the time of the marriage, the articles are absolutely null as respects them, unless confirmed after the attainment of majority. In such a case a confirmation of the articles by the wife must be express, and made in the same manner as any other alienation of property by a married woman; but confirmation on the part of the husband will often be implied from circumstances, such as the acceptance by him of any property under the articles.

It has sometimes been thought that the consent of parents or guardians, and the sanction of the Court of Chancery, might give effect to settlements of their property by infants, which would not have been otherwise binding; but it may now be considered as settled that there is no foundation for such a doctrine.

Marriage is regarded by the law as a valuable consideration, and will support a covenant entered into by a third party to settle property upon the husband and wife and their issue, whether the settlor be one under a natural obligation to make a provision, as in the case of a parent, or merely a stranger; and such a covenant will be enforced not only against the settlor himself, but against his heir, devisee, or personal representative.

Settlements made after marriage, when no valuable consideration, that is to say, no consideration in money or property, is given for them, are generally called, in contradistinction to those made upon marriage, voluntary settlements, and the persons who take under them are called volunteers; though, as such settlements may have good considerations to support them, the application of the term is not always strictly accurate. By a good consideration, as distinguished from a valuable one, is here meant that love and affection which is naturally supposed to subsist between near relations, such as parents and children, brothers and sisters, uncles and nephews or nieces.

Specific performance of voluntary covenants to settle property will be enforced in Equity only in favour of those persons for whom the covenantor is under a natural and moral obligation to provide, that is to say, in favour of his wife or children, but not in favour of any other class of volunteers. If however any valuable consideration has really been given either by the person who, by himself or his representative, claims execution of the articles, or by a third person, in favour of the object of the limitation, specific performance will be decreed, and no objection can be made on account of want of relationship between the parties: and, for this purpose, it is sufficient if the fact of a consideration being given can be inferred from the circumstances. Though a person whose claim is not supported by a good or valuable consideration cannot himself compel the execution of articles in his favour, he may yet have the benefit of a suit instituted by another, for in decreeing specific performance the court executes the entire articles, though they may embrace limitations to persons in whose favour it would not have originally interfered.

2. Next, as to the validity of marriage-settlements against creditors and purchasers.

Marriage being a valuable consideration, the circumstance of the settlor being indebted, or even insolvent, at the time of the execution of the settlement, can have no effect on its validity, even though the persons who have the benefit of the settlement should have full notice of such insolvency. A conveyance or assignment of property in consideration of marriage stands on the same ground with a sale for money, which is not affected by the insolvency of the vendor. If however the settlor be a trader, and a fiat in bankruptcy has issued against him prior to the execution of the settlement upon which he is afterwards duly found a bankrupt, such settlement, like all other conveyances of the bankrupt under the same circumstances, will be void; and it would seem that a settlement must in all cases be void as respects the wife, if she had notice of a prior act of bankruptcy, and a fiat issues within twelve calendar months after such act of bankruptcy. (2 & 3 Vic., c. 29, and 2 & 3 Vic., c. 11, s. 13.)

The marriage consideration does not extend or give the character of purchasers to all persons in whose favour limitations may have been introduced into the settlement. In relation to any other persons than the husband and wife and the issue, the settlement is, it seems, to be considered as voluntary, and subject therefore to the rules applicable to voluntary gifts and covenants.

Settlements made after marriage, it is obvious, can derive no support from the consideration of marriage, and their validity or invalidity must therefore depend upon other circumstances.

A postnuptial settlement by the husband, of any species of property made in consequence of a valuable consideration moving either from the wife herself, who gives up an interest that she possesses in property over which she has a disposing power, or from her relations or friends, is good against all persons whatsoever, if the consideration be not so inadequate as to raise the presumption of fraud. And even in case of inadequate consideration, the settlement, it seems, will be good to the amount of the consideration. It is sufficient if the consideration, though not paid, is properly secured. Contemporaneous settlements will in general be presumed to have been made in consideration of each other; and it seems that parole evidence of consideration is admissible, though none appear upon the instrument itself.

The statute 13 Eliz., c. 5, enacts that 'all conveyances, &c. of lands and tenements, goods and chattels, made of malice, fraud, covin, collusion, or guile, for the intent or purpose of delaying or defrauding creditors and others of their just and lawful actions, suits, debts, &c., shall be deemed and taken (only as against those persons, their heirs, successors, executors, &c.) to be clearly and utterly void, frustrate, and of none effect; any pretence, colour, feigned consideration, expressing of use, or any other matter or thing to the contrary notwithstanding.' But the act is expressed not to extend to any interest or estate made, conveyed, or assured, upon *good consideration and bonâ fide*, to any person or persons 'not having at the time of any such conveyance or assurance to them made any manner of notice or knowledge of such covin, fraud, or collusion as is afore said.' Upon this statute it has been determined, (1) That if the settlor be not indebted at the time, the settlement, even though entirely voluntary, is good against subsequent creditors; (2) That the mere existence of debts at the date of the settlement will not invalidate it if the settlor be solvent; that is, if he be possessed of property sufficient for the payment of his debts independent of the property so aliened; (3) That a settlement which might have been invalidated in the hands of the donee will be good against the creditors of the donor in the hands of a purchaser from the donee for valuable consideration without notice.

Voluntary obligations not affecting particular property, such as bonds, though the grantor should have been solvent at the time of making them, will not, it seems, entitle the grantee to come in *pari passu* with creditors for value, who will always be preferred; but the cancellation or release of a voluntary obligation, if untainted by fraud, may form a valuable consideration for the conveyance of property or for a substituted engagement.

By the 27 Eliz., c. 4, all conveyances, &c. of lands, tenements, or hereditaments are declared void when made with intent to defraud subsequent purchasers for money or other good consideration; 'any pretence, colour, feigned consideration, or expressing of any use or uses, to the contrary notwithstanding.' There is a saving of all conveyances made upon *good consideration and bonâ fide*. It also makes void, as against the same persons, all conveyances 'with any clause, provision, article, or condition of revocation, determination, or alteration at (the grantor's) will or pleasure,' whether such clause extend to the whole interest conveyed, or only partially affect it; but then follows a proviso 'that no lawful mortgage made *bonâ fide* and without fraud or covin, upon good consideration, shall be impeached or impaired by force of this act.' This statute has been construed to extend to all voluntary conveyances, though not in fact made with intent to defraud, and though the purchaser had notice of the prior conveyance. The consequence of this is, though probably not intended by the framers of the act, that it is impossible to make an irrevocable free gift of lands or tenements. As to what is a voluntary settlement, and what is a good consideration to sustain a settlement against a subsequent purchaser under this act, see Sugden, *On Vendors and Purchasers*, vol. ii., p. 161, *et seq.*

The statute 27 Eliz., c. 4, does not apply to personal estate. It has been determined on this act, by analogy to the determination on the last-mentioned act as to creditors, that a purchaser from a voluntary grantee will be preferred to a subsequent purchaser from the grantor. The *good* consideration mentioned in this and the preceding statute must be a valuable consideration (that is to say), either a property or marriage consideration. The consideration of blood has no application to either of these statutes, and therefore a conveyance made in consideration of 'natural love and affection,' as in the case of a postnuptial settlement upon a wife and children, is considered, for the purposes of these statutes, as voluntary. It has been decided however that a husband, having made a voluntary settlement on his wife and children, has no equity to compel specific performance of his contract with a subsequent purchaser; but he can sell the property which he has so settled, and the purchaser will have a good title, and can enforce performance of the contract for sale, if the husband should refuse to convey the property.

By stat. 21 Jac. I., c. 19, all voluntary settlements of traders were invalidated by their bankruptcy, though they might have been solvent at the time of making them; but the stat. 6 Geo. IV., c. 16, s. 73, has placed the settlements of traders on the same footing with voluntary alienations in general.

Property cannot be settled so that the interest taken by any person under the settlement shall be unaffected by his bankruptcy; but it may be given to a man until he shall become bankrupt, provided there is a gift over of the property on that event. In the same manner the property coming from the wife may be settled on the husband so as to be devested on his bankruptcy. But when the property is the husband's own, it has been determined that, though the claims of the husband's creditors might have been defeated by a trust of the whole for the separate use of the wife, a limitation of the property to the husband until his bankruptcy, with a gift over in that event to the wife or any other person, is void. Upon the same principle, a bond or other obligation given by the husband upon his marriage, conditional for the payment of a sum of money to trustees for his wife and children in the event of his bankruptcy, is void as against his creditors who claim under the fiat, if he has received no portion with his wife; but if he has received a portion with her, the obligation, being considered so far as a settlement of the wife's property, will be good against the creditors to the extent of it.

3. As to secret settlements and agreements in fraud of the marriage contract.

Secret settlements of her property made by the wife pending the treaty for marriage, without the privity of the husband, are void as against him, if made in derogation of his marital rights; and this, it seems, is equally true, whether the husband knew of the existence of the property before the marriage or not. The rule applies to every species of gratuitous incumbrance created by the wife upon her property under such circumstances.

The courts of equity, upon the general principles on which they act in cases of fraud, will set aside all secret covenants or agreements entered into contrary to the good faith of the marriage treaty, and not with the privity of all the parties to the settlement. Relief in such cases will not be refused even to a person who was a party to the fraudulent transaction of which he complains.

Upon the same principle, if a creditor or holder of any security or charge on the estate of one who is engaged in a treaty of marriage, misrepresent the amount of his debt or incumbrance to any of the parties to the contract, whether for the purpose of promoting the marriage, or for any other purpose, he will be bound by such misrepresentation. Money which has been lent to a woman for the purpose of being represented as her own, cannot, after the marriage, be claimed as a debt from the husband.

4. Settlements of real property usually consist of limitations of an estate or estates for life to one or more persons *i.e.* (where the settlement is made on marriage), to one or both parents and the survivor of them, with remainders over to their children. When such settlements are made previous to the marriage, and the children are of course unborn, the remainders to them are contingent, and the tenants for life would therefore have it in their power to destroy such remainders. [Remainder.] It has accordingly become the universal practice to insert, after the limitations of life estates to the parents, a limitation to trustees to preserve contingent remainders, followed by remainders to the first and other sons of the marriage severally in tail, with remainders over. This is what is called a limitation in strict settlement. By this method the estate is rendered inalienable till the eldest son of the marriage attains the age of twenty-one, when he can join with his father in barring his own estate tail and all the remainders over, whereby a new estate in fee simple is acquired, and the property may be settled again. [Primogeniture; Remainder.] This was formerly effected by means of a common recovery [Recovery], but it is now effected by a deed executed under the provisions of 3 & 4 Wm. IV., c. 74. By this act fines and recoveries are abolished, and the objects of these old modes of assurance are now obtained by a deed which must be enrolled in Chancery within six months after its execution. As, before this act, a tenant in tail expectant on a particular estate of freehold could only have barred his own issue by a fine [Fine], unless he could obtain the concurrence of the owner of the particular estate in suffering a recovery, so, under the new act, his power is equally limited, unless he can obtain the concurrence of the owner of the first existing estate under the settlement (whether it be for life or lives, or any greater estate, not being an estate for years) prior to the estate tail, who is called the protector of the settlement. The act contains several provisions for the purpose of ascertaining who shall be protector in the cases of joint ownership, coverture, and the existence of estates for years or in dower; and it provides for the cases where the protector is a lunatic, or convicted of treason or felony. The act also gives the settlor power to appoint by the deed a protector of the settlement, in lieu of the person who would otherwise have been the protector. The consent of the protector must be given either by the deed of assurance or by a separate deed, which must be enrolled in the same manner as the assurance itself. The same act repeals (except as to settlements made before the 28th of August, 1833) the statute of 11 Hen. VII., c. 20, whereby women who were seised of estates tail of the gift of their husbands (*ex provisione viri*) were prohibited from alienating them.

The estates limited in settlements of real property may be either legal or equitable. [Uses.]

When charges are intended to be created upon real estate, as for jointures or portions for children, it is usual to limit terms of years out of the estate to trustees for securing payment of the charges by perception of the rents and profits, or by sale or mortgage of the estate for the periods so limited. These terms are inserted at proper places in the settlement, according to their objects, among the other limitations; and such limitations as are subsequent to these terms of years in the order of arrangement, are also made subject to them in point of legal and equitable interest. It is usual to provide that the terms shall cease when their objects are accomplished or become unnecessary or incapable of taking effect.

Estates for lives and terms for years are incapable of being entailed; but they, as well as personal property of any kind, may be settled in trust as effectually, and so as to be inalienable for as long a time as estates of inheritance. The property in such settlements is usually assigned to trustees in trust for the husband, or for the husband and wife for his or their life or lives and the life of the survivor; and then in trust for the first and other sons severally, and the heirs of their bodies. This limitation vests the absolute interest in the eldest son, who will be entitled to dispose of the property upon his attaining the age of twenty-one; but in order to provide for the event of the eldest son dying under age and without issue, in which case his interest would otherwise vest in his father, if alive, as his heir or next of kin, it is usual to introduce a proviso that the property shall not vest absolutely in any son dying under the age of twenty-one years and without issue; and it has been determined, that, in construing settlements of both real and personal property, when the real estates are limited in strict settlement, and the personal property, according to a form frequently adopted, upon and for the same trusts, estates, and purposes as the freeholds, as far as the law will permit, a proviso of the kind above mentioned is to be understood.

There is no restriction as to the number of life estates which may be limited in settlements to take effect in succession, provided the persons be all in existence at the date of the settlement; for, in point of fact, this amounts to no more than an estate for the life of the survivor.

Thus it appears that real or personal property may be settled so as to be inalienable for a life or any number of lives in being, and twenty-one years after. To this must be added a period of nine months, which is allowed for the birth of a posthumous child in cases where gestation exists. As the period of twenty-one years was no doubt adopted originally with reference to the term of minority, which must elapse before an estate tail could be barred, it was formerly thought that this period could not at all events be added to an executory trust; but it is now settled otherwise. All restraints on alienation beyond the above-mentioned limits are void, as tending to what is called in law a perpetuity; and all the subsequent limitations, if contingent, are also void. The same rules are applicable to executory devises, and springing and shifting uses [WILLS; USES]; but not to remainders limited to take effect after estates tail, which are not subject to any restriction; because, as such limitations may be defeated at any time by barring the estates tail, they can have no tendency to a perpetuity.

The forms of settlements may be varied according to the objects and intentions of the parties, and the construction of the articles upon which they are founded. The principle upon which a Court of Equity acts in executing marriage articles, is to look rather to the intentions of the parties as deducible from the circumstances, than to the literal meaning of the words employed by them. Thus, when the words used in articles concerning the settlement of real estate are such as would give the father an estate tail, and thereby enable him to defeat the settlement, the court will in general direct limitations in strict settlement to be executed, under which the father will take a life estate only. Upon the same principle, even though a deed of settlement has actually been executed after marriage, if it appear to be in any respect inconsistent with the letter or spirit of the antenuptial articles, the court will rectify it.

Questions frequently arise as to what powers, covenants, and provisos are to be introduced into marriage settlements made in pursuance of executory trusts, whether created by articles, wills, or other instruments. The determination of these depends entirely upon the rules of construction as applied to each particular case.

Of the powers usually introduced into settlements of real estate, the most important are—powers of jointuring and raising portions; powers of leasing and management; and powers of sale and exchange.

Where the wife, upon whose marriage the settlement is made, does not take a life interest in the estate in the event of surviving her husband, provision is usually made for her by way of jointure in bar of dower. [JOINTURE; DOWER.] In addition to this, powers are frequently introduced to enable the husband, in case of his surviving his wife, and marrying again, and sometimes also the other tenants for life under the settlement, to make provision for their widows, by way of jointure, which the nature of their estate would not have otherwise entitled them to do. Powers of jointuring, and powers for charging the estate with portions for the benefit of the younger children of the then existing or a future marriage, will not, it seems, be inserted in settlements executed under the direction of a Court of Equity, without clear authority for them in the articles; for without such authority the court can have no data by which to regulate the quantum of interest to be taken by the donees.

Powers of leasing for the usual term of twenty-one years are essential to the management of an estate, and will be considered as authorised by the use of the most general expressions in the articles; or perhaps introduced as a matter of course; but a power to grant building leases will not, it seems, be implied without express authority.

Powers of sale and exchange are also considered as usual powers in a settlement, and will be authorised by the use of very slight expressions in the articles.

In settlements of personalty, where the property is assigned to trustees, they are empowered to invest and lay out the funds, and also to vary the securities from time to time. After the declaration of trusts for the husband and wife and children, such settlements usually contain powers of providing for the maintenance, advancement, and education of the children who are or may become entitled to shares in the funds under the preceding trusts.*

Settlements both of real and personal estate usually conclude with what are called trustee clauses, that is to say, clauses which enable the trustees to give effectual receipts; to provide for the appointment, when needful, of new trustees; for the indemnity of the trustees against involuntary losses; and for the payment of their expenses.

Marriage settlements sometimes contain covenants to settle particular lands; covenants to settle, or to purchase and settle lands of a certain value, or future real estate; covenants to settle present or future personalty; and covenants by parents, on the marriage of one of their children, to leave to that child an equal or some porportionate share with the rest.

The covenant to settle particular lands of course binds heirs, devisees, and all into whose hands the lands come, except a purchaser for valuable consideration without notice; and, in case of the lands being so alienated, satisfaction may be claimed out of the general assets of the covenantor.

Questions frequently arise upon covenants to settle, or to purchase and settle lands of a particular value, as to what amounts to performance. On this point the following positions appear to be established:—1, Where the covenantor has no lands at the time, any purchase he may afterwards make will be presumed to have been made in pursuance of the covenant; 2, It seems, though there are conflicting authorities upon the point, that if the covenant be *to settle*, and the covenantor, having at the time lands adequate to the performance of the covenant, die without making any purchase, the lands which he had at the time will be bound to the extent of the covenant; 3, Where the covenant is to *purchase and settle*, it seems that no lands of which the covenantor is seised at the time will be affected, but all after-purchased lands will be affected to the extent of the covenant.

Covenants to settle future real estate of which the husband shall become seised during the marriage, or during his life, do not affect lands of which the covenantor is then seised, but extend to all after-acquired lands, even to such as come to the husband under the provisions of the deed of settlement.

Covenants to settle present or future personalty are considered as applying to capital only, not to income. If real estate should have been purchased with the personalty subject to such a covenant, the land is not bound *in specie* by the covenant, but is charged with the money invested in the purchase.

Covenants to leave one child an equal or proportionate share with the rest, attach only upon that portion of the settlor's property which may remain at the time of his death. The parent may therefore make an absolute gift of any part of his property in his lifetime to another child without committing any breach of his covenant; but a gift reserving any interest to himself is a breach of it. The benefit of such a covenant is confined to children living at the death of the parent.

5. Marriage is not an absolute gift to the husband of the wife's personal estate, but only entitles him to so much of it as he may have reduced into possession, assigned or released during his lifetime. Accordingly, questions frequently arise upon settlements as to the title of the husband, under them, to the whole of his wife's fortune. Upon this point the following propositions appear to be established:—1, The antenuptial settlement of property made by the husband upon the wife, in consideration of her fortune, entitles him only to her *then*, and not to the *future* personal property; 2, That if a part only of her fortune appears to have been stipulated for, the residue of what she then has, or what may afterwards accrue to her, will not belong to the husband; 3, That when it appears from the settlement, either expressly or by implication, that the agreement was for the whole of the wife's present and future personal estate, the husband, or his personal representative (in case of his predeceasing his wife), will be entitled to claim the whole under the contract.

When the husband has not entitled himself by contract to the *choses in action* of the wife, there is no bar to his getting possession of such of them as are recoverable at law; but if he require the assistance of a Court of Equity for the recovery of them, and the wife does not consent to his obtaining the whole, that court will not lend its aid, except upon the terms of the husband's making a provision for the wife and her children, by way of settlement, out of the fund. Most frequently one half of the fund is directed to be settled, but the proportion given in each case depends upon the circumstances, though it never amounts to the whole. The rules of the Court of Equity in directing settlements out of the wife's equitable *choses in action* are the same, whether the application to it is made by the husband himself or by his creditors. Settlements out of the wife's equitable *choses in action*, when made by the husband, are no less valid against his creditors than when made under the direction of the court; and even a settlement by him of the entire fund, which the court would not have directed, has in some cases been held valid against his creditors; though the decisions in those cases seem hardly consistent with the law as laid down under the 13 Eliz., c. 5.

(SEPARATE USE; Cruise, *Digest*, vol. iv.; Roper *On*

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* Similar clauses are contained in settlements of real estate, where there are trusts for raising portions.

Husband and Wife; Martin's *Conveyancing*, by Davidson, vol. i., art. 'Settlement.')

SETTLEMENT. [POOR LAWS.]

SETTLEMENT, ACTS OF. [GEORGE I.]

SETUBAL, or ST. UBES, a sea-port town of Portugal, in the province of Extremadura, is situated in a bay of the Atlantic, at the mouth of the river Sandão, with an excellent harbour capable of receiving ships of any burden. It is fifteen miles south-east of Lisbon. The town is supposed to have been built out of the ruins and on the site of the antient Cedobriga, which was destroyed by the Moors. The environs abound in corn, wine, and oil, and above all in salt, of which last article a large quantity is annually exported. The streets are well paved and tolerably clean, and the town is defended by eleven bastions, and several outworks, besides a very strong citadel called San Felipe, and a fort, the Outaõ, which serves as a lighthouse, and defends the mouth of the harbour. Setubal contains five parish churches, several convents, now shut up, and one hospital. It had once an academy for the study of mathematics, called 'A Academia problematica,' founded by John V. The population is estimated at about 18,000.

SEVAJEE, surnamed *Bosla*, the founder of the Mahratta power in India, was born in May, 1627, at Poonah, the *jagheer*, or fief, of which was held by his father Shahjee, under the kingdom of Ahmednuggur, and, after its dissolution, from the Beejapoor monarchy. His restless and ambitious character appears to have developed itself at a very early age, as in 1647 he had supplanted his father at Poonah, and in the following year possessed himself of all the Northern Concan. The Beejapoor government was then fully occupied in guarding against the aggressions of the Delhi Moguls: and Sevajee continued for several years to extend his power by progressive encroachments without coming to an open rupture, till his spoliations became so daring that in 1658 a large force was sent against him under Afzul Khan, a leader of reputation. He succeeded however in assassinating[*] the general at an interview; routed and dispersed his army, and maintained himself in the field till 1662, when a peace with Beejapoor left him in possession of his acquisitions. But he now came into collision with the formidable power of Aurungzebe, with whose armies in the Dekkan he was unable to cope; and though he succeeded by a sudden irruption (January, 1664) in surprising and sacking the distant emporium of Surat, from which he brought off an immense booty, he found it expedient in the following year to make his submission to the emperor, and cooperating with the Mogul troops in their invasion of Beejapoor, did distinguished service in the campaign. He was disgusted however by the haughty reception which he met with at the court of Delhi; and having made his escape with difficulty from the capital, he reoccupied his former territories, which he greatly enlarged at the expense of the falling kingdoms of Beejapoor and Golconda, avoiding for some years to renew hostilities with the Moguls. This interval he employed in settling his dominions, and introducing a strict system of discipline into his army; and when the war with Aurungzebe broke out anew (1670), he not only ravaged the country with his light cavalry, and inflicted a second sack on Surat, but in 1672 for the first time engaged and defeated a regular Mogul force in a pitched battle. To this period is also assigned the commencement of the *chout*, a sort of tribute or *blackmail*, consisting of the fourth of the revenue, on the payment of which any province was exempted from devastation, and which long continued a principal source of Mahratta revenue.

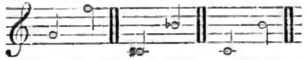
He had for several years previous assumed the title of raja, and the royal prerogative of coining money; but in 1674 he was solemnly crowned at Rayghur, with all the pomp of the Mogul ceremonial, signalising his accession by an inroad in which he for the first time carried his arms north of the Nerbudda. His next exploit was in a different direction: having secured his rear by an alliance with Golconda, he boldly crossed the peninsula (1676) to the eastern coast, possessed himself of the strong forts of Vellore, Gingi, and Wandiwash, between Madras and Pondicherry; and overran great part of Mysore, to which he laid claim from his father Shahjee having held a jagheer there at the end of his life. From these conquests he was recalled (1678) by the invasion of Golconda by the Moguls; and though his plans were for a time disconcerted by the desertion of his son Sambajee to the enemy, he compelled Aurungzebe's viceroy of the Dekkan to retire from Golconda, and to raise the siege of Beejapoor, while he exacted from the latter state, as the price of his aid, the cession of all the country between the Toombuddra and the Kishna. His power was now predominant throughout Southern India, none of the shattered sovereignties of which were able to oppose any check to his progress; but his further schemes of aggrandisement were cut short by a sudden illness, of which he died April 5, 1680, aged nearly fifty-three. His son Sambajee (who had previously resumed his allegiance) succeeded him; but neither his abilities nor his fortune were equal to those of his father, and he was taken and put to death in 1689.

Sevajee (in the words of Mountstuart Elphinstone) 'left a character which has never since been equalled or approached by any of his countrymen. The distracted state of the neighbouring countries presented openings by which an inferior leader might have profited; but it required a genius like his to avail himself, as he did, of the mistakes of Aurungzebe, by kindling a zeal for religion, and through that a national spirit among the Mahrattas. It was by these feelings that his government was upheld after it had passed into feeble hands, and was kept together, in spite of numerous internal disorders, until it had established its supremacy over the greater part of India.'

SEVASTOPOL. [SEBASTOPOL.]

SEVENOAKS. [KENT.]

SEVENTH, in Music, a dissonant interval, of which there are three kinds,—the minor or ordinary seventh, from G to F; the diminished seventh, from C sharp to B flat; and the major or sharp seventh, from C to B. Ex.:



For the *chord* of the seventh, its inversions and treatment, see CHORD.

SEVER, ST. [LANDES.]

SEVERITE occurs massive, in pieces from two to five inches in diameter. Fracture uneven. Fractured surfaces dull. Hardness 1· to 1·5; yields easily to the knife. Brittle. Polishes by friction. Adheres strongly to the tongue, but emits no argillaceous odour when breathed on. Colour white. Streak shining. Dull. Slightly translucent. Found near St. Sever in France, in a gravelly soil. Severite, as shown by the annexed analysis by Pelletier, is a hydrated silicate of alumina:—Silica, 50; Alumina, 22; Water, 26; Loss, 2.

SEVERN AND WYE. The Severn is the finest, and, next to the Thames, the largest and most important of British rivers. The river Wye, being one of its chief tributaries, will be included in this article, as well as some notice of the Bristol Channel.

The original name of the Severn was Hafren, of which Severn is only a corruption. It was subsequently called by the Romans Sabrina, a name given to it, as it is said, in consequence of the fate of Sabra, or Sabrina, who was the daughter of Locrine, king of Britain, by Estrildis, a captive virgin, to whom, in order to unite himself, Locrine had divorced his former queen Gwendolen. On the death of the king, Gwendolen assumed command, and caused Sabrina and her mother to be drowned in the Hafren, which from that time received her name. Milton, in his 'Comus,' has made her the goddess of the river. The attendant spirit says:—

> 'There is a gentle nymph not far from hence.
> That with moist curb sways the smooth Severn stream,
> Sabrina is her name, a virgin pure;
> Whilome she was the daughter of Locrine,
> That had the sceptre from his father Brute,' &c.

Some antiquarians derive the name *Sabrina* from *sabr*, 'sand,' or *sabrin*, 'sandy;' and others derive the present name of the river from its Saxon appellation *sæferne*, 'sea-flowing.' Severn however, as already stated, is the same word as Hafren.

The Severn rises on the western border of Montgomeryshire, from a chalybeate spring on the eastern side of Plinlimmon, at a very considerable elevation, and within a very short distance from the sources of the rivers Wye and Rhiedol. It flows eastward about twelve miles to Llanidloes, as far as which place it still retains the original British name of Hafren. At Llanidloes the Severn receives the waters of the Clywedog; and thence it inclines to the north-east by Newtown and Welshpool; near the latter place it becomes navigable for small boats and barges. Some distance below Welshpool it is joined by the Vyrnwy, a considerable stream which rises on the north-western edge of Montgomeryshire. Previously to this accession the Severn receives in Montgomeryshire, on its right bank, the Mule and the Camlet, and on its left the Tirannon, the Garno, and the Rhiw. About one mile below the confluence of the Vyrnwy, the Severn quits Montgomeryshire, of which county this river and its tributaries form the chief drainage. The length of its course to this point is about 51 miles.

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[*] The singular weapon, called a *tiger's claw*, with which this murder was effected, is now in the Museum of the East India Company

Previous to entering Shropshire, the Severn inclines to the east, and this is its general direction through the vale of Shrewsbury, which town it nearly surrounds. From Shrewsbury it takes a south-eastern course (its extreme northern point being a few miles above Shrewsbury), through Coalbrook Dale to Bridgnorth, and enters Worcestershire a short distance above the town and port of Bewdley. The principal tributaries of the Severn in Shropshire are: on the right bank, the Meole or Red-brook, which enters at Shrewsbury; the Cound, Marbrook, and Borebrook; and on the left, the Perry, Tern, Bell-brook, and Worf. The Severn receives the whole of the waters of the interior of Shropshire, and its course through that county is between 60 and 70 miles. From Bewdley the river runs southward from Stourport, where it receives the Stour on the left, and about eight miles lower down the Salwarpe joins it on the same side. Five miles farther it reaches Worcester. Two miles below this city the Severn receives a considerable accession of water from the right bank by the junction of the river Teme, the principal part of whose course is in Worcestershire; but which rises in Radnorshire, and flows through portions of Herefordshire and Shropshire. Still flowing nearly south, the Severn passes Upton, and quits Worcestershire at Tewkesbury, where it receives the Avon, and enters Gloucestershire. [AVON, *Upper.*]

From Tewkesbury the river again changes its direction, and gradually inclines to the south-south-west, which direction it chiefly follows for the remainder of its course. One mile above the city of Gloucester the stream divides into two channels, the left and main branch flowing by Gloucester, and the right receiving the Ledden. These two branches unite a little below Gloucester, forming the rich tract of land called Alney Island. From Gloucester the river pursues an extremely winding course to Newnham, previously receiving the river Frome from the left. A short distance below Newnham its channel widens considerably; and although it retains the name of *river* as far as the mouth of the Bristol, or Lower Avon, it is in fact rather the æstuary of the Severn than the river itself. The width of this æstuary between the village of Frethern below Newnham and the mouth of the Avon, where the Bristol Channel may be said to commence or terminate, varies from one to three miles. The total length of the Severn, from its source in Montgomeryshire to the Bristol Channel, is about 200 miles.

In the antient division of Britain, the Severn appears to have formed the boundary between the territories of the Silures and the Ordovices on the west, and the Dobuni on the east. In the subsequent divisions of counties, it has scarcely anywhere been employed as a line of separation.

In the commencement of its course, the valley of the Severn is narrow, and supplies little pasturage; below Llanidloes it gradually opens, and is from one to two miles wide, and tolerably productive. The range of the Plinlimmon hills, which, extending west, comprises the Long mountain, and terminates in the Breidden hills, separates the drainage of the Severn from the Wye, Teme, Clun, &c. By this range also the course of the Severn is deflected to the north. On the west and north-west the Berwyn mountains separate the tributaries of the Severn from those of the Dovey and the Dee.

In respect to navigation, the Severn has long been of very great importance. It supplies the means of transporting the produce of mines and manufactories of various descriptions lying in the vicinity of the river to the sea, to North Wales, and the towns and remote districts of the counties through which it flows. The river being navigable for barges from near the town of Welshpool in Montgomeryshire, 'there seems,' says Mr. Telfourd, 'good reason to infer that water-conveyance was practised in this district at as early a period as in any part of Great Britain situated at an equal distance from the sea.' In consequence chiefly of this, Shrewsbury has for several centuries past been a sort of metropolis for North Wales. In Shropshire there are extensive iron-works, as well as large manufactories of china, wedgwood, and other earthen wares, nearly the entire produce of which is distributed by barges and boats on the river. The transmission of coal and lime is also facilitated by the same means.

The importance of the Severn, in consequence of the medium of intercourse which it affords between the large towns on its banks, such as Gloucester, Worcester, Shrewsbury, &c., is very considerable; but in estimating the advantages which a navigable river presents, care should be taken to distinguish between its *natural* and *artificial* importance. Under the former may be classed those advantages we have just enumerated, viz. the exportation of those productions, manufactured or unmanufactured, which exist independently of and unassisted by the river, while to the latter must be referred those advantages derived by the inhabitants of cities and towns which were originally indebted for their very formation and existence to their situation with respect to the river. In the latter case the river supplies those demands which it was originally the means of creating.

Along the greater part of its course the use of the Severn as a navigable river has been much impeded; first, by the fords and shoals which are frequent in a river the bed of which has a considerable declivity and consists of matter of such different qualities; and, secondly, by the deficiency of water in drought, and the superabundance of it during rainy seasons.

It is said that the inconvenience arising from the latter cause was much increased by the embankments raised to protect the low lands in Montgomeryshire and in the upper parts of Shropshire. Previously, when the river was flooded, it overflowed these low lands to a great extent, and they, operating as a side reservoir, took off the top waters; and on the other hand, these waters, gradually returning into their former channels, furnished a supply for the purposes of navigation after the flood had subsided. It has been suggested that these impediments might be removed by deepening the bed of the stream where the shallows occur, and by the erection of locks and weirs. The former suggestion has been partially carried into effect, but it is remarkable that there is no lock or weir along the whole course of the river.

The fall of the river from Buildas in Shropshire, to Gloucester, is as follows:—

	Distance in miles.	Total fall. ft.	Total fall. in.	Fall per mile. ft.	Fall per mile. in.
From Buildas to Bridgnorth	11	29	6	2	8
Bridgnorth to Stourport in Worcestershire . .	18	41	9	2	4
Stourport to Worcester	13	23	0	1	9
Worcester to Gloucester	30	10	0	0	4
Total .	72	104	3		

Vessels of 110 tons can ascend to Gloucester; those of 80 may go to Worcester; of 60, as far as Bewdley bridge; and those of 30 tons may ascend to Coalbrook-dale.

The barbarous and expensive custom of hauling barges by men instead of horses is gradually losing ground, but such a beneficial change has been retarded owing to the want of an act of parliament on the subject, without which it seems impossible to obtain the consent of the owners of property on the banks to the establishment of a horse towing-path. The whole of the Severn navigation, extending upwards of 160 miles, is free from tolls.

The commercial importance of the Severn has been much increased by its connection with several canals, which are here enumerated. The Stroudwater Canal, which commences at the Severn near Framiload, between Gloucester and Newnham, and terminates in the Thames and Severn Canal, thus uniting our two greatest navigable rivers. The Stroudwater Canal was commenced in 1760, and the latter (the Thames and Severn) in 1783, and opened in 1789.

The Gloucester and Berkeley Canal, which shortens the navigation from the Severn near Berkeley, to Gloucester, was completed in 1826.

The Gloucester and Ledbury Canal, which is about to be extended from the latter town to Hereford.

The Worcester and Birmingham Canal.

The Droitwich Canal, which runs along the valley of the Salwarpe.

The Staffordshire and Worcestershire Canal, which commences at Stourport, on the Severn, and following the course of the Stour, joins the Birmingham and Liverpool Junction Canal.

The Shropshire Canal, which with its branches is used for transporting the produce of the manufacturing district of Coalbrook-dale to the Severn, which it joins at Coalport. This canal was completed in 1792.

The Shrewsbury Canal, originally formed to convey coal to that town from Ketley in Shropshire, has since been extended by a branch through Newport to the Birmingham and Liverpool Junction Canal before mentioned.

The Montgomeryshire Canal commences in the Severn at Newtown, and passing Welshpool, communicates with a branch of the Ellesmere Canal; but as the Severn is not navigable as high as Newtown, this canal can hardly be included as one of the connecting links in the Severn navigation.

The Worcester and Birmingham Canal, hitherto one of the most important in connection with the Severn, has been materially diminished in value, as regards the traffic between Gloucester and Birmingham, by the line of railroad lately opened from the former city through Cheltenham to Birmingham, and passing within a short distance of Worcester. A bill was however introduced into parliament during the last session (February—July, 1841) for improving the navigation of the river between Gloucester and Worcester.

The fish found in the Severn are salmon, shad, lampreys, roach, dace, gudgeon, bleak, flounders, eels, lamperns, elvers, chub, carp, trout, grayling, tench, and perch. Salmon was formerly so plentiful that, according to Dr. Nash, a clause was commonly inserted in the indentures of the apprentices of Worcester, that they should not be fed upon that fish oftener than twice a week. The Severn salmon is now however a scarce fish, although there are no weirs upon the river to impede their ascent.

Having traced the Severn to the point where it merges in the Bristol Channel, a short distance above which, on the Monmouthshire coast, is the mouth of the Wye, our attention is called to the latter river, which, although inferior in its size and the length of its course to the Severn, is much superior in point of picturesque scenery.

The Wye has its rise on the border of Montgomeryshire, and on the mountain of Plinlimmon, about two miles south-west from the source of the Severn. Taking a south-east direction, it receives a number of little tributaries, and quits Montgomeryshire and enters Radnorshire between the village of Llangerig and the town of Rhayader, at the distance of eighteen miles from its source. At Llangerig the river inclines to the south. The Marteg, a Radnorshire stream, joins it from the left bank. Below Rhayader it receives from the right the waters of the romantic Elan, and at the same place becomes the boundary between the counties of Radnor and Brecknock. Its tributaries from the Radnorshire side are the Ithon, Edw, and Bach-howey; from Brecknockshire, the Irvon at Builth, and several miles lower down a stream from Talgarth. The scenery from Builth to Glasbury and Hay is extremely beautiful. At Glasbury the river inclines to the north, but on entering Herefordshire flows south-east. The extent of surface drained by the Wye from the south side between Hay and Monmouth, a distance of forty miles, is very inconsiderable. The fine range of the Black Mountains throw the waters on the south into the Usk and Munnow and their several tributaries. From Hay the valley of the Wye opens on the left into a wide tract of fertile land, which continues to Hereford. The river is navigable as far as this city, and indeed in the winter, and whenever there is a depth of water, barges ascend to within a short distance of Hay, for the conveyance of timber, &c. About four miles below Hereford it is joined from the north by the Lug, which rises in Radnorshire, and is increased in Herefordshire by the waters of the Arrow and Frome. The general course of the Wye between Hereford and Ross is south-east, but with frequent and considerable bends through rich valleys. From Ross the river has a general inclination first to the south, and then to the south-west, passing under the beautiful ruins of Goodrich Castle. From the cliff called Symond's Yat, a fine view is obtained of the winding river and hanging woods. The Wye makes a singular bend here, for although the direct distance by land from one part of the river to another is not more than six hundred yards, the course by water exceeds four miles. The river for a short distance divides Herefordshire first from Gloucestershire, and subsequently from Monmouthshire, and then enters the latter county. At Monmouth the Munnow joins the Wye from the right, and a mile lower down the smaller stream of the Trothy enters from the same side. The river is again deflected to the south. At Redbrook it forms the boundary between Monmouthshire and Gloucestershire, and continues to divide them to its mouth. At Brook's Weir the river is met by the tide, and this is the point where the maritime and internal navigations are connected. Vessels from thirty to ninety tons reach this spot. Flowing past the village of Tintern, to the magnificent ruins of whose abbey [MONMOUTHSHIRE] it lends additional beauty, the river flows under Wyndcliffe and through the romantic grounds of Piercefield to Chepstow. [CHEPSTOW.] The appearance of the river from Tintern to its mouth is greatly deteriorated by the muddy and turbid state of the tidal water. At Chepstow the river is crossed by a massive iron bridge, and about two miles and a half south-west of that town the Wye falls into the æstuary of the Severn.

The spring-tides at Chepstow rise to a great height. Large vessels ascend to Chepstow-bridge, and steamers ply regularly for the conveyance of passengers between that port and Bristol. Above Chepstow large vessels reach as far as the tide will carry them. Vessels varying from 18 to 30 tons go as far as Hereford, but the progress of even these small vessels is impeded by shallows. They are towed against the stream, generally by men.

The length of the course of the Wye is about 130 miles.

The part of the Wye most usually visited by tourists is that from Chepstow to Monmouth and Ross, and this is the finest and most picturesque portion of its course. The tour of the Wye, as well as of most rivers, should be commenced at the mouth, and the stream ascended, although in the contrary direction there are views which in the ascent are either lost or seen from a less favourable point; and therefore to see the whole of its splendid scenery to the best advantage, the Wye should be traversed in both directions. The view from Wyndcliffe, comprising the æstuary of the Severn and the Bristol Channel, with the Somersetshire coast in the distance, and the Wye, and town and castle of Chepstow beneath, is not excelled perhaps in the whole world, and certainly not in Great Britain.

Although not so much frequented as the lower part, the whole course of the river above Ross will amply repay a visit. From that town to Hereford the rocks and narrow gorges are, it is true, lost; but in their place the traveller finds the beautiful woods and wide-spreading fertile valleys of Herefordshire. The scenery again on the Welsh border, between Radnorshire on the right, and Brecknockshire and Herefordshire on the left side, may almost rival the most exquisite portions of Monmouthshire; while yet higher, and where the Wye is nothing more than a mountain torrent, there is much to gratify and reward the time and toil expended in the excursion.

Owing to the isthmus or neck of land above the mouth of the Wye, and the projection of Aust Cliff on the opposite shore, the width of the Severn is here only one mile, while higher up, as was before stated, it expands to between two and three miles. At this narrow part of the æstuary is the principal passage, called Aust Ferry, or Old Passage, from Somersetshire to Monmouthshire and South Wales. About four miles lower down is the New Passage, which is considerably wider, and not so much frequented.

The æstuary of the Severn receives the drainage of about 5900 square miles, viz.:—the Severn, 4500; the Wye, 1400.

The Severn, with its tributaries, includes the greater portions of the counties of Montgomery, Salop, Worcester, Warwick, and Gloucester, and small parts of Radnor and Hereford, while the latter effects almost the entire drainage of the counties of Radnor and Hereford, and parts of Montgomery, Brecknock, Gloucester, and Monmouth. In the former river is included the Teme, one of its principal tributaries, which drains a great portion of the land lying between the Severn and Wye.

In examining the superficial deposits of the districts through which the Severn and its tributaries flow, Mr. Murchison has drawn some very important and interesting conclusions respecting the antient state and position of this district. In Herefordshire, parts of Shropshire and Worcestershire, and the adjoining Welsh counties, the loose detritus covering the surface is found to be of local origin, or, in other words, derived from the rocks in the immediate neighbourhood, but testifying the action of water from the north-west to the south-east. The drifted matter being of local origin, the inference is, that the action of the water producing it was also local, and unconnected with any vast or general deluge. From the sometimes elevated position of the gravel, and other circumstances, it is also to be inferred that the high coombs, as well as valleys, were permanently under the level of the sea. The nature of the excavation also indicates the action of water propelled at different times by various causes. This tract is exempted from foreign drift, and is in a great measure circumscribed by the course of the Severn; but although the direction in which this detritus has moved corresponds with the general direction of the present drainage of the country, it is impossible that it can be the result of fluviatile action; and accordingly whenever the rivers quit the main course of this drift, these coarse materials are no longer found upon their banks. The Severn presents an example of this. It has been before observed that this river in its course through Montgomeryshire into Shropshire is deflected to the north. The materials of the drift do not accompany the river in this bend, but are 'strewed over hill and dale in a south-easterly direction.' Farther west however, and in large tracts of Lancashire, Cheshire, Shropshire, Staffordshire, and Worcestershire, the detritus is derived from various centres, and is overspread by a great drift from the north. 'The country from which this drift proceeded is clearly shown by its contents; for none of the varieties of granite and other rocks which it contains, occur in Wales or the adjacent parts of England, but they are all well known to exist in Cumberland and Scotland. This granitic detritus is further proved to have issued from the north, not only by its greater volume in that direction, but also by the blocks diminishing gradually in size as they are traced from north to south.' The western side of this tract appears to be the edge of the high lands of Denbighshire, and an irregular line from thence to Oswestry, and south-east towards Shrewsbury, and from thence nearly along the right bank of the Severn to the vale of Worcester. The eastern side has no well defined limits as yet observed, until it reaches the vale of Worcester, where it occurs in the form of a delta, included between the Malvern and Cotteswold hills. The western boundary appears to follow the junction of the members of the Silurian system with the new red-sandstone and other more recent deposits, the latter being the portions covered. The valley of the Severn amply proves that the present relative position of hill and plain had no connection with the boundary of this northern drift. It has been stated that the edge of this drift is from Oswestry to Shrewsbury; now between those places 'there are no continuous ridges ranging from east to west which could oppose the southward course of this drift. On the contrary, the ridges of Silurian rock trending from the south-west expose their north-eastern extremities, leaving between them a succession of longitudinal valleys which are open to the tract which is strewed over with the granitic bowlders.' The most striking of these valleys is that of the Severn; for although the northern drift occupies heights north of and several hundred feet above this valley, not a trace of it occurs south in the low grounds beyond the Breidden hills, which would have been the case if the present relative positions had existed, for then the northern drift must have been propelled far into the low depression from which the Severn issues into the plain of Shrewsbury. Mr. Murchison naturally infers that great changes have taken place in the relative levels, and that 'while the country about Shrewsbury was sea, the Severn of that epoch must have terminated at the Breidden hills, by emptying itself into a bay in which the northern drift was accumulating. This hypothesis is further sustained by tracing the present line of the Severn to the south, after it has escaped from the gorge of Bridgnorth. Throughout this portion of its course, the river flows in the same direction as the great northern drift, and thus the elbow made by the latter from Oswestry to Bridgnorth can be explained satisfactorily by inferring that the Silurian region constituted an antient line of shore during the period when the whole of the present valley of the Severn, from the Breiddens to the mouth of the river, was submarine.' From the facts here stated, and from a variety of other corroborative evidence, Mr. Murchison is led to believe in the existence of a great channel of the sea, extending southwards through Worcester and Gloucester, the eastern and western shores of which were the Cotteswold and Malvern hills. The former chain presents sloping escarpments to the valley of the Severn, with salient and re-entering angles, precisely like the headlands of a shore formed by the action of a sea upon the soft and hard materials. On the opposite side the sharp ridge of the Malverns stands out like a mural buttress on the flank of the Silurian region, reminding the traveller of rocks of similar form and composition on the sides of straits. Elevations of this region must have subsequently taken place, and reduced the Bristol Channel to its present form.

The Severn is charged with a larger amount of turbid sediments than any other river in Europe; the result of its own long course and of those of its tributaries through tracts of marl and soft sandstone. Richard of Cirencester notices this peculiarity in his treatise 'De Situ Brit.,' lib. 1, cap. vi.: 'Hæc erat celebrata illa regio Silurum, tribus validissimis habitata populis, quos inter præ reliquis celebres Silures, proprie sic dicti, quam ab ora relicta *turbidum Sabrinæ fretum* distinguit.'

Shakspere also—

> 'Three times hath Harry Bolingbroke made head
> Against my power: thrice from the banks of Wye,
> And *sandy-bottom'd Severn*, have I sent him
> Bootless home and weather-beaten back.' (*Henry IV.*)

This fine sediment is in some places deposited on its banks towards the mouth, and the quantity thus deposited is increased by artificial means. The mud is encouraged to accumulate upon lines of pile and osier, which, as the tide retreats, retain the sediment. Upon these, other lines of osier-fencing are placed, until the new land is raised to a considerable height. This plan has been very effectually practised by Lord Segrave. On the other hand, the sudden rising of the tides has occasioned great damage to the low lands, to guard against which, sea-walls, piles, and other precautionary means have been adopted. The inundations in the years 1606, 1687, 1703, and 1737, are recorded to have produced great devastation.

The Bristol Channel, commencing with the æstuary of the Severn, separates Monmouthshire and South Wales from the counties of Somerset and Devon, and terminates in St George's Channel. Its width from King's Road, the mouth of the Lower Avon, to the opposite coast, is about five miles. It then rapidly widens to about twelve miles, but is again slightly contracted between the southern point of Glamorganshire and the western part of Somersetshire. It again expands, forming, on the Welsh coast, Swansea and Carmarthen bays, and on the coast of Devonshire, Barnstaple or Bideford Bay. The width at its termination in St. George's Channel, taken from St. Gowan's Head on the coast of Pembrokeshire to Hartland Point in Devonshire, is about forty miles. The coast-line, both on the Welsh and Devonshire sides, is extremely irregular. Lundy Island is situated between 10 and 11 miles north-north-west of Hartland Point in Devonshire. Its length from north to south is two miles and a half, and its width from east to west about one mile. It is composed of granite. [DEVONSHIRE.] Caldy Island is about four miles off the Pembrokeshire coast. There are several smaller rocky islets in different parts of the channel.

The relative times and heights of the tides of the Bristol Channel are laid down as follows:—

	High Water Time.		Height of High Tide
	h.	m.	feet
Lundy Island	5	15	27
Hartland	5	20	26
Appledore	5	30	
Barnstaple Reach (6 miles up)	6	0	
Bideford Branch	6	0	
Ilfracombe	5	45	
Fairland	6	10	33
Minehead	6	30	38
Sully	6	45	31
King's Road	6	45	46
Bristol	7	0	48
Chepstow	7	30	70

From Hartland Point to King's Road is about ninety miles; it appears that the tide travels over this distance in about an hour and a half. The tide increases as it advances.

The high tide at Chepstow is accounted for on 'the principle of the conservation of force.' When any quantity of matter is in motion, its motion is capable of carrying every particle of the mass to the height from which it must have fallen to acquire its velocity, but if the motion be employed in raising a smaller quantity of matter, it is capable of raising it to a height proportionally greater. In bays and channels which narrow considerably, the quantity of water raised in the narrow part is less than in the wider, and thus the rise in such cases is greater. The magnitude of the tides will also be increased by the banks acting as the portion of a shore in which there is a point of convergence of tides which always produces an augmentation. The great tide, at Chepstow does not affect the river as high as Tintern, its force being absorbed by friction and various other causes.

The *Bore* which enters the Severn is nine feet high, and is produced, as in other places, by the depth and quantity of water on the inland side not allowing the surface there to be immediately raised by means of the transmitted pressure.

The greatest velocity of the tidal current through the 'shoots,' or New Passage, is fourteen miles an hour. This occurs lower down two hours after high-water, but as the Severn is approached the difference of time is diminished, according to the general observations on this subject. (Whewell 'On Tides,' in *Phil. Trans.*)

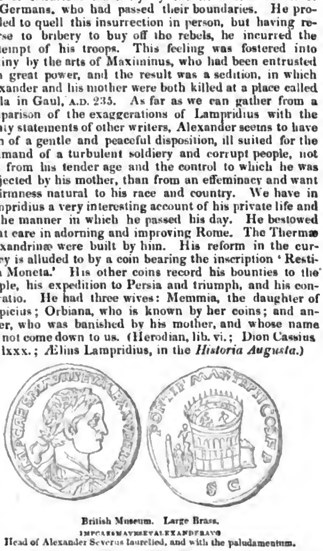
According to Mr. Ham of Bristol, the water of the channel is of a higher temperature on the Welsh coast than on the Somersetshire side, being at 67° Fahrenheit on the former, when 65° near the mouth of the Avon. The cause is probably the fact that the bed of the channel on the Welsh side is much more shallow than on the opposite coast, and consequently a greater space of the bottom is exposed to the rays of the sun on that side at low-water; but these experiments should be repeated and confirmed. The increased quantity of mud held in suspension on the Welsh side is also attributed to the shallowness of the water there. Of five samples taken from the surface, the following were the results:—

	Per Imp. Gallon.	
At the mouth of the Avon the water contains	26·3	grs.
In the deep part of the Channel .	28·5	
Advancing farther, where the water begins to shallow . . .	35·0	
On the opposite coast . . .	72·0	
Mouth of the Usk . . .	39·5	
5)	201·3	
Average	40·3	

The quantity of mud in an area of 225 square miles (the extent to which these data are supposed to apply, and taking the above as an average at the depth of one fathom) will be about 700,000 tons.

SEV'ERUS, MARCUS AURELIUS ALEXANDER, a Roman emperor, was the son of Julia Maminæa, the sister of Soemis, who was the mother of Elagabalus. He was born at Arca Cæsarea, in Phœnicia, in the temple of Alexander the Great (after whom he was called), A.D. 208. In his early years he was brought up at Rome, and during the reign of his cousin Elagabalus was, by the advice of his grandmother Julia Mæsa, bred in strict seclusion from the court. In his education his mother showed great care and discretion, and withdrew him from the temptations and perils thrown in his way by the emperor. In his twelfth year he was appointed consul with Elagabalus, and was styled Cæsar, the usual title of the successor to the empire. He became very popular with the army, who believed him to be the son of Caracalla, a notion which he appears to have afterwards encouraged. The particulars of the revolt in which Elagabalus was murdered have already been given. [ELAGABALUS.] On his death, Alexander was made emperor, A.D. 222, first by the proclamation of the army, and afterwards more formally by the senate. His reign may rather be called the regency of his mother, who conducted the chief business of government with great firmness and discretion. She made it her first care to repair the ruin caused by the excesses of Elagabalus. She restored the temples which had been profaned, selected a council of 16 from the senate for her ministry, and appointed the jurist Ulpian præfect of the Prætorian guard. Under her guidance Alexander led a life of strict but not ascetic morality, giving free access to his friends, applying himself closely to the business of the state, and in his leisure hours to literature.

The attempts of the empress-mother to reform the dissolute army were frustrated by their turbulent spirit. The Prætorian guards revolted and murdered Ulpian, and such was the weakness of the government, that Epagathus, their ringleader, was sent to Egypt, that he might there undergo the punishment which it was not thought safe to inflict at home. Dion Cassius informs us, in the fragment of his Life of Alexander, that his own life was threatened by the troops which he commanded, but saved by the management of the emperor. In the latter part of his reign (about 231 A.D., according to Eckhel, 'Doctrina Vet. Num.,' from the evidence of a coin), Alexander undertook an expedition against Artaxerxes, the founder of the dynasty of the Sassanidæ, who threatened to extend his empire over Asia Minor, and treated the embassies from Rome with disdain. The accounts of this war differ. Lampridius (*Hist. Aug. Script.*), in his Life of Alexander, Eutropius, and Aurelius Victor speak of the great victory obtained by Alexander, and their testimony is confirmed by a coin described by Eckhel. On the other hand, the narrative of Herodian (lib. iv., 13, &c.), more consistent throughout with itself, with the undisciplined state of the army, and the unwarlike character of the emperor, records the defeat of the Roman forces in three separate divisions, the sickness of Alexander, and his retreat to Antioch, whither however he was not followed by Artaxerxes, whose resources were so much weakened by the war that he remained quiet for several years. The emperor was shortly afterwards roused from a state of luxurious inactivity by the news of a revolt of the Germans, who had passed their boundaries. He proceeded to quell this insurrection in person, but having recourse to bribery to buy off the rebels, he incurred the contempt of his troops. This feeling was fostered into mutiny by the arts of Maximinus, who had been entrusted with great power, and the result was a sedition, in which Alexander and his mother were both killed at a place called Sicila in Gaul, A.D. 235. As far as we can gather from a comparison of the exaggerations of Lampridius with the scanty statements of other writers, Alexander seems to have been of a gentle and peaceful disposition, ill suited for the command of a turbulent soldiery and corrupt people, not less from his tender age and the control to which he was subjected by his mother, than from an effeminacy and want of firmness natural to his race and country. We have in Lampridius a very interesting account of his private life and of the manner in which he passed his day. He bestowed great care in adorning and improving Rome. The Thermæ Alexandrinæ were built by him. His reform in the currency is alluded to by a coin bearing the inscription 'Restituta Moneta.' His other coins record his bounties to the people, his expedition to Persia and triumph, and his consecratio. He had three wives: Memmia, the daughter of Sulpicius; Orbiana, who is known by her coins; and another, who was banished by his mother, and whose name has not come down to us. (Herodian, lib. vi.; Dion Cassius lib. lxxx.; Ælius Lampridius, in the *Historia Augusta.*)



British Museum. Large Brass.

IMPCAESMAVRSEVALEXANDERAVG

Head of Alexander Severus laurelled, and with the paludamentum.

PONTIFMAXTRPIICOSPPSC

The amphitheatre of Titus, with two gladiators fighting in it; at the side three figures standing.

SEVE'RUS ALEXANDRI'NUS, a Greek rhetorician, who lived about A.D. 470. There are extant under his name six Narratives (Διηγήματα), and eight Ethopoeiæ ('Ηθοποιΐαι).

The six narratives are mentioned by Iriarte as being among the Greek MSS. of the Escurial. The Ethopoeiæ are printed in Gale's 'Rhetores Selecti,' which were edited by J. F. Fischer, Leipzig, 1772.

An Ethopoeia, of which *allocutio* is the Latin equivalent, is defined by Priscian to be 'an imitation of a speech (*sermo*), adapted to the character and to the supposed persons; as, for instance, what Andromache might have said on the death of Hector.' The Ethopoeiæ of Severus contain, among others, the following subjects: what Æschines might say on going into banishment upon Demosthenes furnishing him with means for his journey; what Menelaus might say upon Helen being carried away by Alexander; what a painter might say on having painted a girl and fallen in love with her. The frigid commonplaces of these short pieces are merely curious as specimens of the literature of the age to which they belong.

SEVE'RUS, CORNE'LIUS, an epic poet of the time of Augustus. Respecting the circumstances of his life nothing is known, except that he died very young. Quinctilian (x. 1, § 89) says that he was more a versifier than a poet, though he allows that, considering the early age at which he wrote, he showed very great talents. His poems were: 'Bellum Siculum,' the first book of which was, according to Quinctilian, of considerable merit. Which Sicilian war he described in this poem is not certain, but it is supposed that it was the war which Sextus Pompeius carried on after he had gained possession of Sicily. [POMPEIUS, p. 386.] There is a poem still extant, called 'Ætna,' which contains, in 640 hexameters, a description of Mount Ætna, and an account of the causes of its eruptions. Now as Seneca (*Epist.* 79) calls Cornelius Severus the author of a poem 'Ætna,' it has been supposed that this poem is the work of Severus. But the language in the extant poem, as well as several allusions to events which happened in the reigns of Claudius and Nero, place it beyond doubt that the extant poem is not the work of Severus. The description of Mount Ætna to which Seneca alludes was probably only a part of the 'Bellum Siculum.' A second poem of Cornelius Severus contained a description of the death of Cicero, and a fragment of it, which proves the great talents of the young poet, has been preserved by Marcus Annaeus Seneca. (*Suasor.*, vii., p. 49.)

(Burmann, *Antholog. Lat.*, ii. 155; Wernsdorf, *Poet. Lat. Minor.*, tom. iv., p. 33, &c., and p. 217, &c.)

SEVE'RUS, L. SEPTI'MIUS, was a native of Leptis in Africa, where he was born, A.D. 146, of an equestrian family. It is impossible to give more than a rapid sketch of the life of this enterprising man.

After his eighteenth year Severus came to Rome for his improvement, and received the rank of senator from M. Aurelius. He studied law in company with Papinian, who was a relation of his second wife, under Q. Cervidius Scævola; and he received from Aurelius the office of advocatus fisci, in which he was succeeded by Papinian. In his youth he was of licentious habits, and he had to defend himself against a charge of adultery, of which however he was acquitted before the proconsul Didius Julianus, whom he afterwards succeeded in the empire. After filling the quæstorship and other public offices, he was appointed proconsul of Africa, his native country. Under Aurelius he also filled the tribunate, an office of which he scrupulously discharged the duties. About this time he married his first wife, Marcia. After the death of Aurelius, he visited Athens; and when he became emperor, he showed the citizens that he had not forgotten certain slights put upon him during his residence there. Under Commodus he held the office of legatus of the Lugdunensis Provincia. On losing his wife, he looked out for another whose nativity was favourable to his ambitious views; for Severus appears to have been a believer in astrology. He heard of a woman in Syria whose destiny it was to marry a king, and accordingly he solicited and obtained in marriage for his second wife Julia Domna, by whom he had children.

Severus was at the head of the army in Germany when news came of the death of Commodus, which was followed by the short reign of Pertinax, and the accession of Didius Julianus, who purchased the imperial title. The army proclaimed Severus emperor, and the ambitious general promptly advanced upon Rome to secure his title. Julianus, after a fruitless attempt to stop the progress of Severus by declaring him a public enemy, and an equally unsuccessful attempt to get him assassinated, caused a senatus consultum to be passed for associating Severus with him in the empire. Julianus however was shortly afterwards murdered in his palace, and Severus entered Rome with his soldiers (A.D. 193), where he was acknowledged emperor.

But Severus had a formidable rival in the East, where the legions had proclaimed Pescennius Niger. After arranging affairs at Rome, he set out to oppose Niger, whom he defeated near Cyzicus. The emperor banished the wife and children of Niger, and punished both individuals and cities that had favoured the cause of his rival. He also advanced still farther into the East, into the sandy plains of Mesopotamia, in order to secure the empire on that side and to punish the adherents of Niger. The Parthians and Adiabeni were reduced, and Severus was honoured with the titles of Arabicus, Adiabenicus, and Parthicus by the senate, who also offered him the honour of a triumph, which he refused on the ground that a triumph was not due to a victory gained in a civil war; and he also declined adopting the title of Parthicus from apprehension of provoking such formidable enemies as the Parthians.

On his road to Rome Severus heard of the revolt of Albinus in Gaul, and he directed his march to that province. After the war had been carried on for some time with various success, a great battle was fought at Trinurtium or Tinurtium, not far from Lyon, in which Albinus was defeated and lost his life. On this occasion Severus disgraced himself by that brutal ferocity which was so prominent a feature in his character. He ordered the head of Albinus to be cut off before he was quite dead, and he made his horse trample the body under his feet. Even the wife and children of Albinus, according to some accounts, were put to death, and their bodies thrown into the Rhone. Numerous partizans of Albinus were put to death, both men and women, whose property enriched the ærarium. Spartianus has filled a chapter with illustrious names, who were the victims of the emperor's cruelty, either immediately on the defeat of Albinus or shortly after.

The restless temper of the emperor led him again into the East. From Syria he marched against the Parthians, and took Ctesiphon, their capital, after a campaign in which the soldiers suffered greatly for want of proper provisions. From Parthia he returned to Syria, from which country he marched through Palestine to Alexandria in Egypt. He made many changes in the institutions of Judæa, and forbade under severe penalties the making of Jewish converts. Spartianus adds, that he made the same enactment with respect to the Christians, though we cannot certainly infer from the context that this took place at the same time with the enactment against Jewish converts. The allusion however appears to be to the edict promulgated in the time of Severus, which was followed by a persecution of the Christians. He gave the Alexandrines a kind of senate (jus buleutarum), and made many changes in their institutions.

Severus returned to Rome A.D. 203. He declined the honour of a triumph which was offered to him, on account of his inability to stand in a chariot owing to the gout. But his victory was commemorated by the erection of a triumphal arch, which still remains and bears his name. [ROME, p. 98.]

In the year A.D. 208, Severus, with his two sons, Caracalla and Geta, set out on their British campaign. The object was to reduce to obedience the Caledonians and other tribes in the northern part of the island, who disturbed the Roman dominion. Geta was left with an army in the command of South Britain, and the emperor undertook the campaign in the north with his son Caracalla. He made his way with great difficulty through a country covered with forests and without roads, and though the natives fled before him, the Roman army suffered greatly, and the loss of life, owing to privation of various kinds, was immense. Severus attempted to secure the limit of his conquests by constructing the great rampart, which is known by the name of the wall of Severus, across the neck of land that separates the æstuaries of the Clyde and the Forth. [BRITANNIA.]

The last days of Severus were embittered by the dissentions of his sons, and more particularly by the undutiful conduct of Caracalla, who is even accused of conspiring against the life of his father. He died at York (Eboracum) A.D. 211, in the eighteenth year of his reign, leaving only two children, Geta, and Caracalla, who is also called Antoninus Bassianus. His body, or, according to other accounts, the urn which contained his ashes, was carried to Rome and placed in the tomb of the Antonini.

Severus was one of the most distinguished among the Roman emperors. He has been compared with Julius Cæsar, whom he resembled in the energy of his character and in his taste for letters. He was through life the faithful friend of the great jurist Papinian, whom he made libellorum magister and præfectus prætorio, and to whose care he recommended his two sons. He was well acquainted with Greek and Latin literature, and he left behind him memoirs of his life. His habits were plain and simple. He sought out and rewarded merit, and he loved justice. But he punished with inexorable severity, and his great qualities were sullied by cruelty, for which it seems difficult to find any apology or palliation. He embellished Rome with various works, such as the Septizonium and the Thermæ called after his name, and he repaired the public edifices which had been erected by his predecessors.

(Ael. Spartiani, *Severus Imperator;* Herodian, ii., iii.; Dion Cassius, lib. 76, &c.)

British Museum. Actual size.

SEVERVSPIVS AVGPMTRPXII.
Head of S. Severus laurelled.

COSIIILVDSAECFEC.
Commemoration of the celebration of the Ludi Saeculares.

SEVERUS'S WALL. [BRITANNIA.]

SE'VIGNE', MADAME DE. MARIE DE RABUTIN CHANTAL was born, according to her own account, February 5, 1627, apparently at the château of Boubilly in Burgundy. Her father, the Baron de Chantal, was killed in defending the Isle of Rhé against the English; and her mother also left her orphan at an early age. The charge of her education then fell into the hands of a maternal uncle, the Abbé de Coulanges, an excellent and judicious person, whom she warmly loved, and to whom she owed and owned great obligation. Possessed of great personal advantages and considerable fortune, she married, Aug. 1, 1644, when not yet 18, the Marquis de Sévigné, of an antient house of Brittany. This connection did not prove happy; it was dissolved in 1651, by the death of her husband in a duel, leaving her with a dilapidated fortune and the charge of a son and daughter. The fortune she soon retrieved by retirement and a judicious economy: and in 1654 she re-appeared in Paris, where her beauty and talents placed her at once in the first ranks of society. The Prince of Conti, Turenne, Fouquet, superintendant of finance, and many others of less note, in vain enrolled themselves her admirers; having escaped the yoke of her first ill-assorted marriage, she was never tempted to contract a second; nor, in that gallant age, was her conduct tainted by the prevalent laxity of morals. Her children were throughout life her chief object, and especially her daughter, to her affection for whom we owe the greater part of that admirable collection of letters upon which the fame of Madame de Sévigné is raised. That daughter in 1669 married the Comte de Grignan, who held the government of Provence. Madame de Sévigné died, after a few days' illness, at the town of Grignan, in 1696.

As a letter-writer she is unsurpassed, perhaps unequalled. Unstudied, and not always correct, she possessed a natural eloquence, an ease and liveliness of expression, which will never cease to attract. The merit of her style is said by French critics to be too delicate to be readily appreciable by foreigners: nevertheless its charm cannot fail to be manifest in a greater or less degree to all her readers. 'The letters of Madame de Sévigné,' says La Harpe, 'are the book of all hours, of the town, of the country, on travel. They are the conversation of a most agreeable woman, to which one need contribute nothing of one's own; which is a great charm to an idle person. . . . . Madame de Sévigné tells a story excellently: the most perfect models of narration are to be found in her letters. Nothing comes up to the liveliness of her turns, and the happiness of her expressions: for she is always touched by what she relates; she paints things as if she saw them, and the reader believes that he sees what she paints. She seems to have had a most active and versatile imagination, which laid hold of all objects in succession.'

Her letters, originally published in detached portions, by different persons, are printed collectively in numerous editions. The most complete is that of M. de Monmerque, Paris, 1818, 11 vols. 8vo., and 13 vols. 12mo., containing a text corrected and restored in very numerous passages, and including ninety-four letters not before published. The edition of M. Grouvelle, 8 vols. 8vo., Paris, 1806, is also one of the best, containing memoirs of Madame de Sévigné herself, her daughter, and other persons closely connected with her history, and other auxiliary pieces. These collective editions contain many letters addressed to Madame de Sévigné by her correspondents.

SEVILLE (*Sevilla*) is the name of a province of Spain, which, according to the late division of the Spanish territory, extends from the Sierra de Cazalla in the north, to the Serrama de Ronda in the south; and is bounded on the east by the province of Cordova, and on the west by the frontiers of Portugal and the ocean.

SEVILLE, the capital of the province, is a large and handsome city, situated in a beautiful plain on the banks of the Guadalquivir (the Baetis of the Romans). The name Guadalquivir is a corruption of the Arabic Wada-l-Kebir, 'the great river.' It is in 37° 12′ N. lat. and 6° 8′ W. long. Fable has ascribed its foundation to Hercules, but there can be no doubt of its being a very antient city, perhaps of Punic origin. It is mentioned by Strabo (iii., p. 141, Casaub.), Pomponius Mela (ii. 6), Pliny (iii. 1), and Silius Italicus (iii. 392). Its Phœnician name was *Spali* or *Sephala*, which in that language means a plain. Of this word the Romans and Greeks made *Ispalis* or *Hispalis;* the Arabs *Ishbilia*, and modern Spaniards *Sevilla*. Under the Romans it became a Roman colony under the name of 'Colonia Julia Romula,' as appears by many of the coins, and from the statement of Pliny ('Hispalis Colonia cognomine Romulensis') and Strabo. Hispalis gave name to one of the four juridical conventus into which the Roman province of Baetica was divided. Julius Cæsar visited it twice, once as quæstor, and a second time as prætor, when he was instrumental in relieving the citizens from the impositions and tyranny of Metellus. It was for some time the residence of the successors of Alaric, and in 582 took part in the rebellion of Hermenegild against his father Leovigild. In 712 Seville opened its gates to the Arabs, who made it the seat of their empire. Abdu-l-aziz, son of Músa Ibn Nosseyr, held his court in it, and it was not till the time of Ayúb (others say Al-horr) that the seat of the Arab government in Spain was transferred to Cordova on account of its more central position. Seville continued to be the second city of the Mohammedan empire of Spain until the middle of the eleventh century, when a revolution in Cordova detached it from the empire, and Seville became the capital of a separate kingdom.

Moorish Kings of Seville.—In the year 1023 the citizens of Seville, having revolted against Al-Kásim Ibn Hamúd, who then held the supreme power in Spain, appointed three of their number, namely, Mohammed Ibn Al-alehani, Mohammed Al-zubeydi, and Mohammed Ibn Abbád, chief kádhi of the mosque, to administer the government and provide for the security of the place. The latter, having soon after rid himself of his partners in power, assumed the insignia of royalty, and took the title of king. Having marched against Yahya Ibn Hamúd, Al-kásim's nephew and successor, he defeated his army and put him to death near Camona in 1035, and thus was enabled greatly to extend his dominions. On his death in 1041, Mohammed was succeeded by his son Mohammed II., surnamed *Al-mútadhedh-billah* (he who implores the help of God), and Abu Amru, who made himself master of Cordova and the greater part of Mohammedan Spain. He was an able and warlike prince, but very cruel. Grief for the loss of a favourite daughter caused his death in 1068. His second son, Mohammed III., surnamed *Al-mu'tamed-billah* (he who places his reliance in God), inherited his dominions, which comprised all the territories between the Guadalquivir and the Tagus. The limits of this empire were however considerably narrowed by the victories of Alfonso VI., the conqueror of Toledo, who gradually took possession of his best provinces and strongest castles. Mohammed then called to his aid the Almoravides of Africa, whose king, Yúsuf Ibn Táshefin, crossed the straits, and gained in 1086 the memorable battle of Zalaca. The conqueror soon turned his arms against the allies whom he came to defend. Seville was taken in 1091 by Syr Abú Bekr, one of his generals, and Mohammed was sent to the castle of Aghmát in Africa, where he ended his days in 1095. Seville continued in the hands of the Almoravides, and after them in those of the Almohades, who succeeded them. Abú Yusuf Yakub Al-mansúr, the third sultan of the latter dynasty, who reigned from 1163 to 1178, fixed his residence in Seville, which he greatly embellished by laying the foundations of the great mosque, repairing the Roman aqueduct, called the 'Caños de Carmona,' throwing a bridge of boats over the Guadalquivir, strengthening the fortifications, and other useful works. After Al-mámún, the last sultan of the Almohades who ruled in Spain, Seville was reduced by Abú Abdállah Mohammed Ibn Hud, who resided for some time in it; but on the death of this chief, who was assassinated at Almeria in 1238, the city was besieged by Ferdinand III., king of Castile, and taken after fifteen months, on the 23rd of November, 1248. From that period Seville always made part of the dominions of the king of Castile.

Seville is almost circular, and the circuit is from five to six English miles. It is surrounded by walls partly of Roman, partly of Moorish construction, flanked by numerous towers, and has fifteen gates. The suburbs are eight in number, San Bernardo, San Benito, San Roque, Macarena, los Humeros, la Cesteria, Populo, and Triana, which last is supposed to derive its name either from three antique arches which its gate once had, or from the emperor Trajan. The streets, as in most cities built or inhabited by the Moors during their occupation of the Peninsula, are crooked, ill paved, and exceedingly narrow. Seville however contains several fine squares, such as San Francisco, now called 'de la Constitucion,' El Duque, Salvador, and several others. The houses, which amount to about 12,000, are perhaps the most picturesque in the world. They have generally a large paved court, ornamented with running fountains, flowers, &c., and surrounded by marble columns supporting galleries or rooms above. It is usual for the family to inhabit the ground floor in summer, and the upper stories in winter. In the summer a canvas awning is thrown over the whole court during the heat of the day, and removed at night, and there the family usually sit to receive their visitors. The public walks in Seville are much admired. The principal are 'El Paséo de Christina' and 'Las Delicias;' the latter, which is tastefully planted with odoriferous shrubs, was not completed till 1828.

Seville contains many buildings remarkable either for their antiquity or architecture. 'La Torre del Oro' (the tower of gold) is so called they say because the ships laden with that metal, at the time of the discovery of America, deposited their cargoes there. 'La Lonja,' or Exchange, is a magnificent building, erected by Philip II. in 1523, over which are the archives of the colonies. The 'Casa de Pilatos,' or palace belonging to the dukes of Alcala; the town-hall; the naval college of San Telmo; the cannon-foundery; the tobacco-manufactory, an immense building, 600 feet in length by nearly 500 in breadth, enclosing twenty courts; and the famous aqueduct, built or repaired by the Moors, are among the chief edifices of Seville.

The cathedral was founded in the year 1401, on the site of the antient mosque, but was not completed until 1519. Externally it presents a strange mixture of Arabian, Gothic, and Greco-Roman architecture; but upon the whole its general appearance is very imposing. The interior, which is exclusively Gothic, is both rich and grand. Its dimensions are 420 Spanish feet in length by 291 in breadth, and it is the largest cathedral in Spain. Four rows of enormous clustered columns, eight in each row, separate the aisles. The roof of the centre nave and transept is 134 feet above the pavement; the roof of the side aisles is 38 feet lower. The centre aisle contains the choir and the grand altar. Above the choir, which is a large church of itself, and is only separated from the body of the church by a lofty and richly worked grating of iron, is the organ, which contains 5300 pipes with 110 stops, being 50 more than those of the celebrated one at Haarlem. The high altar is ornamented with the richest marbles, paintings, statues, and a profusion of gilding. On grand festivals it is decorated with immense silver mirrors, made in the form of stars and crowns. Behind the high altar is the 'Capilla Real,' a large gloomy chapel, containing the tomb of Ferdinand III., who took the city from the Moors. The other chapels, in all about 26, contain many treasures of art, both paintings and exquisite carvings, by the best masters of the Sevilian school, as Murillo, Zurbaran, Roelas, Pacheco, Cano, Morales, Vargas, Navarrete, and others.

The Giralda, a lofty square tower of Arabian architecture, which originally formed part of the antient mosque, serves now as a belfry to the cathedral. According to the accounts of all the Arabian writers (Al-makkarí, 'Moham. Dynast.,' vol. i., p. 56-225) it was built in 1160 by an architect named Jábir (Gever), to whom the discovery of algebra has been erroneously attributed. It was originally only two hundred and fifty feet high; but in 1568 Fernando Ruiz, an architect, raised it one hundred feet higher. On the top was placed a statue of Faith, of gilt bronze, which, though fourteen feet high, and of the enormous weight of 3600 pounds, turns on a pivot and acts as weathercock, thus giving its name 'Giralda' to the tower. This tower and the court of the orange-trees (Patio de los Naranjos) are the only remains of the antient Moorish mosque, which in point of size and magnificence equalled that of Cordova. Attached to the cathedral is a very valuable library called Biblioteca Columbiana, from the name of the founder Ferdinand Columbus, the son of the great navigator, who bequeathed to it upwards of 20,000 volumes. During the Peninsular War the treasures of the cathedral were removed to Cadiz, and thus saved from the French. They consist of the Custodia, or tabernacle, in which the host is carried in procession through the city, made of solid silver by the celebrated artist Arfe; it is twelve feet high and of enormous weight; a cross and pair of candlesticks made of the first gold brought from America by Columbus; several pieces of gold-plate, and many vestments for the priests, interspersed with precious stones. Seville has also 28 parish churches, and it contained once 69 convents, 40 for men and 29 for women, besides four Beaterios, a species of foundling-hospitals for the education of orphans and poor children. With one or two exceptions the buildings exist, though the communities which occupied them are now dispersed. The convent of La Merced, founded by Ferdinand in 1249, is one of the most remarkable for its size and architecture. It has lately been destined to receive all the pictures and books collected in the convents of the capital and other towns in the province, with a view to the formation of a provincial library and gallery of paintings. The hospital of La Sangre, an immense building, with a beautiful façade, has accommodation for 300 patients. That of La Caridad which contained the finest pictures by Murillo, 'Moses striking the Rock,' and the 'Parting of the Loaves,' before they were taken to Madrid, is another very interesting building. But the edifice which, after the cathedral, most attracts the attention of travellers is the Alcazar (Al-Kasr), or royal palace of the antient Moorish kings, which, though modernised and spoiled by the Christian kings, still preserves much of its original beauty. In its present state it is a compound of Gothic and Arabic architecture. The principal hall, called Sala de los Embajadores (Hall of Ambassadors), is as fine, though not so delicately worked, as that in the Alhambra. It is fifteen yards square, and three times that height. The pavement is of marble, the ceiling is painted in blue and gold, and the pannelling of the wainscots is formed of painted tiles. The gardens which surround the palace are very beautiful. In one of the rooms on the ground-floor are several statues, inscriptions, and other remains of antiquity, which have been found on the site of the antient Italica, the birth-place of Trajan and Hadrian, which is contiguous to Seville. Excavations are now being made there at the expense of the Spanish government.

Seville is the see of an archbishop. It has a university, founded in 1502; an academy of painting, sculpture, and architecture; a society called Amigos del Pais (friends of the country); a literary and scientific institution, named Lycéo, and several establishments for the diffusion of knowledge and education. Its present population is estimated at rather more than 100,000 inhabitants. The trade, which was very considerable, greatly declined at the separation of the Spanish colonies from the mother country; but it has somewhat revived of late—oil, wine, corn, hemp, flax, liquorice, but above all lemons and oranges, are annually exported in great quantities by the Guadalquivir, which is navigable for vessels of one hundred tons. Three steamers leave Seville daily for Cadiz, and as many go from Cadiz to Seville. The climate of Seville is hot, but healthy. The surrounding country to a considerable distance is so low, that it is frequently inundated, whenever the river overflows its banks, which happens on an average once every five years. There are three good histories of Seville: Morgado, *Historia de Sevilla*, Sev., 1587, fol.; Rodrigo Caro, *Antiguedades y Principado de Sevilla*, 1634, fol.; Ortiz y Zuñiga, *Anales Eclesiasticos de la Ciudad de Sevilla*. A description of Seville has lately appeared in this country by Mr. Standish, *Seville and its Vicinity*, Lond., 1840, 8vo.

SEVRES, DEUX, a department of France, bounded on the north by that of Maine et Loire, on the east by that of Vienne, on the south-east by that of Charente, on the south-west by that of Charente Inférieure, and on the west by that of Vendée. The form of the department approximates to that of an oblong quadrangle, having its greatest extension from north to south. The greatest length is from north by west to south by east, from the banks of the Thoué, on the northern border, to the junction of the three departments of Deux Sèvres, Charente, and Charente Inférieure, 79 miles; the greatest breadth, at right angles to the length, is from near Mauzé to the bank of the Dive, on the border of the department of Vienne, 41 miles. The area of the department is estimated at 2351·5 square miles, being nearly the average area of the French departments, and rather less than the conjoint areas of the English counties of Chester and Salop. The population in 1831 was 294,850; in 1836 it was 304,105, showing an increase in five years of 9255, or rather more than three per cent., and giving 129 inhabitants to a square mile. In amount and density of population it is very far below the average of the departments, and also far below the conjoined English counties with which we have compared it. Niort, the chief town, is on the Sèvre Niortaise, 217 miles south-west of Paris in a direct line; or 261 miles by the road through Orléans, Blois, Tours, Châtelherault, Poitiers, Lusignan, and St. Maixent.

The department is traversed by a chain of hills, which extends from the central group of Auvergne to the mouth of the Loire, bearing in part of its course the name of the Heights of Gatines. These hills enter the department from the department of Vienne on the south-east side, and extend into the department of Vendée on the west side; they separate the basin of the Loire from the basins of the Charente, Sèvre Niortaise, and Lay. The average height of these hills is about 450 feet. That part of the chain of hills, and indeed of the whole department, which lies north-west of a line drawn from Fontenay in the department of Vendée eastward to St. Maixent, and from thence northward by Parthenay and Thouars, is occupied by the primary and lower secondary formations: the rest of the department is occupied by the formations of the oolitic group. There are no coal-pits, and in 1834 there was only one iron-work, which had a furnace for making pig-iron and three forges for producing wrought-iron. Marble, freestone for building, and millstones are dug. There are some mineral waters, but none of great repute.

The portion of the department which belongs to the basin of the Loire is drained by the Sèvre Nantaise (one of the two streams which give name to the department), the Thoué, and the Dive, which last skirts the eastern border. Neither of these is navigable, except the Dive for a short distance. The Thoué receives the Cebron, the Thourt, the Argenton, and some other streams. The rest of the department is drained by the Boutonne and one or two other feeders of the Charente; and by the Sèvre Niortaise, and its feeder the Mignon, which are both navigable. The navigation of the Sèvre Niortaise begins at Niort, but is impeded by shallows and by the winding course of the river. The official statement of the navigation is as follows:—Dive 8 miles; Sèvre Niortaise, 22 miles; Mignon, 7 miles: total, 37 miles.

There is, according to the same statement, one navigable canal, viz. that from Niort to Rochelle; but we believe this to be identical, so far as it belongs to this department, with the navigation of the Sèvre. There are a great number of pools, especially among the hills; also a number of marshes.

There were on January 1, 1837, six Routes Royales, or government roads, having an aggregate length of 179 miles, viz. 147 miles in good repair, 6 miles out of repair, and 26 miles unfinished. The principal road is that from Paris to Rochefort, which enters the department on the east side from the department of Vienne, and passes through St. Maixent, Niort, and Maugé, at which town the road to Rochelle branches off. A road from Lusignan (department of Vienne) to St. Jean d'Angély and Saintes (department of Charente Inférieure) crosses this department through Melle, in the south-eastern part; and a road from Saumur on the the Loire (department of Maine et Loire) runs southward by Thouars and Parthenay to St. Maixent, where it joins the road from Paris to Rochefort. Roads run from Niort to St. Jean d'Angély, and to Nantes (department of Loire Inférieure). The departmental roads had an aggregate length of 181 miles, viz. 10 miles in good repair, 3 miles out of repair, and 168 unfinished. The bye-roads had an aggregate length of 20,000 miles.

The temperature in the northern part of the department is colder than in the southern; this is ascribed to its not being so well cleared of wood, and to its having a greater quantity of water, whether standing or running. The summer is not so long, and the heat is tempered by thick fogs. In the southern part the winters are mild, the thermometer scarcely ever falling more than 3° or 4° below zero of Réaumur, or 23° or 25° above zero of Fahrenheit. The south-eastern part is considered the healthiest; in the north fevers and inflammation of the lungs are common; and the inhabitants of the marshy parts are affected by scorbutic complaints, rheumatism, erysipelas, or cancers in the limbs.

The soil varies much; part of it is unproductive, and the backward state of agriculture tends further to diminish the crops; one-third of the best land is constantly in fallow; yet with these deductions the grain-harvest exceeds the consumption of the department. The area of the department may be calculated in round numbers at 1,500,000 acres, of which 1,000,000 acres, or two-thirds, are under the plough. The chief productions are wheat, rye, barley, oats, flax, and hemp. The vine is grown chiefly in the south-west part, where the vintage is converted into brandy. In the north-eastern part about Thouars some tolerable white wine is grown, but in small quantity. The vineyards of the whole department are computed to occupy about 50,000 acres; the gardens and orchards about 24,000 acres. Fruit-trees succeed very well except among the hills; the walnut is extensively cultivated for the sake of its oil. The meadows and other grass lands occupy about 180,000 or 190,000 acres, and the heaths and open pasture-grounds above 50,000 acres. A considerable portion of heath is in the valley of the Sèvre Nantaise, where the land is very poor. The meadows afford pasturage to a great number of cattle, which constitute a considerable part of the wealth of the department. The breed of horned cattle is very good, and a considerable number are sent into Normandie, there to be fattened for the markets which supply Paris. Sheep are also numerous, but the wool is of ordinary quality. The asses and mules which are bred in the neighbourhood of Melle are considered to be among the best in Europe; a considerable number are sent into Spain. Swine and poultry are numerous.

The woodlands amount to about 90,000 acres. Small game is abundant; the deer and the wild boar are found; and wolves have become of late years more numerous than before. The rivers and pools are full of fish.

The department is divided into four arrondissements, as follows:—

Name.	Situation.	Area in Square Miles.	Communes.	Cantons.	Population. 1831.	1836.
Niort	S.W.	555·5	94	10	97,222	100,208
Bressuire	N.	632	91	6	60,826	63,010
Melle	S.E.	538·5	92	7	73,710	75,580
Parthenay	Central	625·5	79	unk.	63,092	65,307
		2351·5	356		294,850	304,105

A later return makes the whole number of cantons or districts, each under the jurisdiction of a justice of the peace, thirty-one.

In the arrondissement of Niort are—Niort, pop. in 1831, 15,832 for the town, or 16,175 for the whole commune; in 1836 18,197 for the commune [NIORT], and St. Maixent, pop. 4329, on the Sèvre Niortaise; Mauzé, pop. 1756 for the town, or 1797 for the whole commune, on the Mignon; Beauvoir, Rohan-Rohan, Cherveux, Champdeniers, and Coulonges. St. Maixent is on the slope of a hill on the right bank of the Sèvre. It is ill laid out, and the houses are ill-built, but the public walks are agreeable, and the neighbourhood abounds with picturesque scenery. It derives its name and origin from a hermitage established here by St. Maixent in the time of Clovis, which was soon replaced by a Benedictine abbey. The town suffered much in the religious wars of the sixteenth century, and in the Vendean war at the close of the eighteenth. It has a chamber of manufactures, a high school, an ecclesiastical school, and an hospital. Serge, hosiery and other woollens, and leather are made; and trade is carried on in corn, mustard, wool, horses, and mules: there are eleven yearly fairs. At Mauzé the townsmen carry on considerable trade in wine, brandy, and in asses, which are bred in considerable number round the town: there are thirteen yearly fairs. Rohan-Rohan is on an elevated site between the Guirande and the Courance, two streams flowing into the Sèvre or the Mignon: there are twelve yearly fairs. Cherveux has considerable markets. At Champdeniers hats, tiles, and leather are made: there are eight considerable yearly fairs for cattle, resorted to by dealers from Navarre, the Basque provinces, and other parts of Spain. At Coulonges, distinguished as Coulonges-les-Royaux, swanskin, drugget, hats, and leather are made; and trade is carried on in wine, timber, and wool: there are twelve yearly fairs.

In the arrondissement of Bressuire are—Bressuire, pop. in 1836, 1894 [Bressuire], Les Aubiers, and Les Echaubroignes, on or near the streams which flow into the Argenton; Argenton, upon the Argenton; Thouars, pop. 2314, on the Thoué; Oiron, between the Thoué and the Dive; and Cerisay and Châtillon-sur-Sèvre, on or near the Sèvre Nantaise. Tiles and fine linen are made at Les Aubiers. Argenton, distinguished as Argenton-le-Château, was almost destroyed in the Vendean war. Serges and flannels are made in the town, and some good red and white wines are grown in the neighbourhood. Thouars was a place of strength in the time of Pepin in the eighth century; and the English, when masters of Poitou, made it yet stronger; it was however taken from them by Duguesclin, A.D. 1372. It was much injured by the revocation of the Edict of Nantes, and was taken by the insurgents in the Vendean war. The town is on the slope of a hill, near the right bank of the Thoué; it is surrounded by walls, partly ruined, and has two handsome churches, a college, two hospitals, one of them for children, and a handsome castle or mansion built by the duchess of La Trémouille in the time of Louis XIII.: there are three public walks. Woollens, linens, hats, and cutlery are made; and trade is carried on in corn, hemp, horses, mules, and oxen: there are eight yearly fairs. Oiron has an hospital and the ruins of a mansion built by Louis XIV. for Madame de Montespan; trade is carried on in wine: there are three yearly fairs. Tiles and linens are made at Cerisay or Cerizay; and linen, cotton-yarn, and paper at Châtillon-sur-Sèvre. This latter was formerly called Mauléon; it was a place of strength: it was destroyed in the religious wars of the sixteenth century, and again in the Vendean war.

In the arrondissement of Melle are—Melle, pop. in 1831, 2252 for the town, or 2512 for the whole commune; in 1836, 2724 for the commune; on the Beronne, a feeder of the Boutonne; Chefboutonne, Brioux or Briou, and Chizé, on the Boutonne; Sauzé-Vaussay, on a small feeder of the Charente; and La Mothe Sainte Héraye or St. Héray, pop. 2150 for the town, or 2673 for the whole commune, on the Sèvre Niortaise. Melle is in a beautiful and fertile country, of which, from its situation on a hill, it has a commanding prospect. The little stream on which it stands becomes dry in summer. The houses are old and ill built; there are some remains of the antient walls, and an agreeable public walk near the town. Druggets and other woollens, and leather are made; and trade is carried on in corn, trefoil and lucerne seed, cattle, and wool: there are twelve yearly fairs. Melle has a court of justice, a stamp-office, an agricultural society, a departmental nursery, and a college. At Chefboutonne are manufactures of serge, drugget, earthenware, and leather; and considerable cattle-markets. At Brioux or Briou there is a tile-work. At Sauzé or Sauzé-Vaussay, coarse linens are manufactured: there are sixteen yearly fairs. La Mothe Sainte Héraye, or St. Heray, is pleasantly situated. Coarse woollens and leather are made, and trade is carried on in trefoil and lucerne seed, flour, cattle, horses, and mules: there are thirteen yearly fairs.

In the arrondissement of Parthenay are—Parthenay, pop. in 1831, 3606 for the town, or 4024 for the whole commune; in 1836, 4288 for the commune; Secondigny, St. Loup, and Airvault, pop. 1815 for the town, or 1925 for the whole commune, on the Thoué; St. Jouin, near the Dive; and Moncoutant, on the Sèvre Nantaise. Parthenay suffered materially in the English wars, the religious wars of the sixteenth century, and the Vendean war. It is on a slope on the right bank of the Thoué. There are several government offices, a college, an agricultural society, and a theatre: there are some manufactures of woollen yarn, coarse woollens, and leather; and considerable trade in corn and cattle is carried on. Secondigny has the ruins of its antient walls and of an old castle. Coarse woollens are manufactured; asses are bred; and trade is carried on in wine, wood, and iron. There are tile-works and stone-quarries near the town. At St. Loup trade is carried on in coarse woollens, leather, wine, and sheep: there are four yearly fairs. Airvault is a tolerably handsome town; it has the ruins of an antient castle, and of a monastery destroyed in the religious wars of the sixteenth century. Woollen stuffs, hempen cloth, linen, and leather are manufactured; and trade is carried on in clocks and watches, sheep, wool, wine, brandy, corn, and flax. St. Jouin has five yearly fairs for corn, flax, and hemp. Good white wine is produced round the town. Woollen stuffs are manufactured, and there are ten yearly fairs.

This department, with the adjacent department of Vienne, forms the diocese of Poitiers, the bishop of which is a suffragan of the archbishop of Bordeaux. It is in the jurisdiction of the Cour Royale and the Académie Universitaire of Poitiers. There are Protestant consistorial churches at Niort, St. Maixent, Melle, La Mothe, Sainte Héraye, and Lezay, near Melle. The department is in the twelfth military division, the head-quarters of which are at Nantes. It returns four members to the Chamber of Deputies. In respect of education this department is just above the average of France. Of the young men enrolled in the military census of 1828-29, 41 in every 100 could read and write, the average of France being a little more than 39 in every 100.

In the earliest historical period this part of France was included in the territories of the Pictones, or Pictavi, and the Santones, two Celtic nations; but the Santones possessed only a very small portion on the southern border of the department. Both were comprehended in the Roman province of Aquitania Secunda. There were very few Celtic or Roman towns within the limits of the department whose names have been transmitted to us. D'Anville is inclined to fix the Segora of the Peutinger Table, a station between Lemunum or Limonum (Poitiers) and Portus Namnetum (Nantes), at Bressuire. The Rauranum of the Antonine Itinerary (Rarauna in the Peutinger Table) may be fixed at Rom, a village on the Dive, in the arrondissement of Melle; and the Brigiosum of the Table, at Brioux or Briou. Both these stations were on the road between Limonum (Poitiers) and Mediolanum (Saintes). In the middle ages, the department formed part of Poitou. [Poitou.]

SEWARD, ANNA, was born in 1747, of good parents; her father being the rector of Eyam in Derbyshire, prebendary of Salisbury, and canon residentiary of Lichfield. Mr. Seward was a writer of poems, which are printed in Dodsley's collection; and in 1750 he published an edition of Beaumont and Fletcher. He encouraged the poetical indications in his daughter with all the gratified pride of a parent. Pope, Young, and Prior were her favourite authors, and she excelled also in ornamental needlework—an accomplishment she carried into her poems, which bear the same relation to poetry as needlework does to art—ingenious, pretty, and trivial.

She had the society of Dr. Darwin, Mr. Day, author of 'Sandford and Merton,' Mr. Edgeworth, and occasionally that of Doctor Johnson, whom she could not bear. In 1782 she published her poetical novel of 'Louisa,' which met with immense success and rapidly exhausted three or four editions. In 1799 she published a collection of 'Sonnets' intended to 'restore the strict rules of the legitimate sonnet.' They are now very little known. In 1804 she published her 'Life of Dr. Darwin,' written in an affected style; destitute of all requisites for biography; wanting in penetration and delineation of character; puerile in judgment and worse in criticism; nevertheless it contains some pleasant literary anecdotes, and is not without interest. In it she lays claim to the authorship of the first fifty lines in the 'Botanic Garden,' which she had written out of compliment to him, but of which he made no mention. She continued to pour forth little poems of questionable merit; but still maintained her popularity.

After a lingering illness, she expired in March, 1809, bequeathing to Sir Walter Scott her literary performances, and particularly the works she had herself intended for the press; and to Mr. Constable, the publisher, her 'Letters.

Scott executed his trust by the publication in 1810 of her 'Poems,' and three volumes of literary correspondence, with a biographical preface. Mr. Constable also published her 'Letters' in six volumes. They afford materials for the study of her character, but they are said to exhibit it in no pleasing light—vanity, bad taste, affectation, and pedantry being mostly prominent.

Posterity, from whose judgments there is no appeal, and with whom the factitious causes of popularity have no weight, has consigned her poems to oblivion, and there is no ground for protesting against this judgment.

SEWER, a place, according to Lord Coke, where water issues, or, as is said vulgarly, 'sues,' whence the word suera or sewer. Callis suggests its derivation from 'sea' and 'weir,' and defines it to be a common public stream, compassed by banks, less than a river and larger than a gutter; but this derivation is devoid of foundation. The word has acquired notoriety as giving the title to 'The law of Sewers,' an important branch of English law. According to that law, the superintendence of the defences of the land against the sea, and against inundation by land-floods, and of the free course of navigable rivers, has been immemorially, 'from the beginning of laws,' says Callis, a matter of public concern: and from very early periods commissions under the common law have from time to time been issued by the crown, empowering persons to enforce the law on such subjects. Many statutes have been passed relating to sewers. The first, according to Lord Coke, is 'Magna Charta,' c. 23, which provides for the taking down of weirs. But the most important of these is 23 Henry VIII., c. 5, commonly called 'The Statute of Sewers,' by which the law was extended, explained, and settled. Several statutes have been since passed, but the most comprehensive is of recent date, 3 and 4 Wm. IV., c. 22. From these two statutes, the decisions especially on that of Henry VIII., and the text-books, the general law of sewers must be ascertained. The act of Wm. IV. does not affect any private or local act for sewers concerning any county or district, &c., or any commission of sewers in the county of Middlesex within 10 miles of the Royal Exchange, except such as lie within any commission of sewers of the county of Essex, or any navigable river, canal, &c. under the management of trustees, by virtue of any local or private act, or any law, custom, &c. of Romney Marsh or Bedford Level. The objects of the law of sewers have been already stated. How those objects are accomplished will most conveniently appear by showing

1. The mode of appointment and qualifications of commissioners of sewers, the duration of their commission and of other acts done under it. 2. The extent, subject-matter, and nature of their authority. 3. The mode by which their authority may be enforced or questioned.

1. The appointment of commissioners of sewers by the late act is vested in the lord chancellor, the lord treasurer, and the two chief justices, or any three of them, of whom the chancellor must be one. Such as have not acted as commissioners before the passing of the statute of Wm. IV., must be possessed, in the same county or the county adjoining that for which the commission issues, of landed estate in fee, or for a term of 60 years, of 100*l*. yearly value, or of a term of 21 years, 10 of which are unexpired, of 200*l*. yearly value, or be heir apparent to an estate of 200*l*. yearly value. Bodies corporate and absentee proprietors possessed of a landed estate of 300*l*. yearly value taxed to sewers may qualify an agent to act as commissioner, provided such agent is named in the commission; persons named ex-officio in any commission as mayor, &c., may act without any further qualification. Callis states that a woman may be a commissioner, for which he says there is warrant in Scripture; for in the first commission which ever issued, the commission of dominion in the first chapter of Genesis, the woman was coupled in commission with the man. He adds also that for anything which appears to the contrary the queen of the South who visited Solomon was a sole queen. A minor above the age of fourteen may be a commissioner. Coincidently with every commission there issues from the crown-office a writ of dedimus potestatem addressed to a list of persons therein named, who are part of the commissioners named in the commission, and authorised to administer the oaths to the commissioners. Previous to entering on office each commissioner takes an oath before these parties for the due performance of his duty, and that he is possessed of the requisite qualification. A commission continues in force for ten years from the date of it; and the laws, decrees, and ordinances made under it, notwithstanding the expiration of the commission, continue in force until they are repealed.

2. Commissioners may be appointed to act in any part of the kingdom of England and Wales or the islands within that kingdom. The English seas are also said to be included within the kingdom of England. Each commission specifies the district to which it applies. The authority of the commissioners extends over all defences, whether natural or artificial, situate by the coasts of the sea, all rivers, water-courses, &c., either navigable or entered by the tide, or which directly or indirectly communicate with such rivers, &c. But they have no jurisdiction over any ornamental works situate near a house and erected previous to the act of Wm. IV., except with the consent in writing of the owner. They have power to repair and reform the defences, and to remake them, when decayed, in a different manner, if this can be done more commodiously. They may also cause rivers, &c. to be cleansed and deepened, and remove any obstructions, such as weirs, mill-dams, and the like, which have been erected since the time of Edward I.: or, if such antient obstructions have been since increased, they may remove the increase. And if any navigable river is deficient in water, they may supply it from another where there is an excess. But the object to be attained by all these acts must be of a general nature, and have for its purpose the furtherance of public general defence, drainage, or navigation. The commissioners have authority also to make and maintain new, and to order the abandonment of old works, and to determine in what way the expenses of the new works shall be contributed. But they cannot undertake any new work without the consent in writing of three fourths of the owners and occupiers of the lands to be charged. They may also contract for the purchase of lands where necessary to the accomplishment of their objects; the price of which, if not agreed on, must be determined by a jury summoned for that purpose. In them is vested the property in such lands, and in all the works, tools, materials, &c. of which they are possessed by virtue of their office. The commissioners have power to make general laws, ordinances, and provisions relating to matters connected with sewers in their district, as well as to determine in particular instances. These laws are to be in accordance with the laws and customs of Romney Marsh in Kent, or 'after their own wisdoms and discretions.' 'Discretion,' says Callis, 'is that herb of grace that I could wish every commissioner of sewers well stored withal.' The mention of it occurs very frequently in the statute of Henry VIII., and would seem to vest, as in truth it does vest, a very large and undefined power in the hands of the commissioners. Notwithstanding however this reference to their discretion, it must always be understood that they have no authority to do anything which is not both just and reasonable, and also in accordance with the laws of the land; or, as Lord Coke expresses it, every commissioner ought to have 'duos sales, viz. salem sapientiæ, ne sit insipidus, et salem conscientiæ, ne sit diabolus.'

To accomplish the purposes for which they are created, the commissioners have power to appoint a clerk, and various officers called surveyors, collectors, bailiffs, &c.; and they themselves, or any six of them, when duly assembled, constitute a court of record. By their own view, or the report of their surveyor, they may ascertain what old defences need repair, what new ones are necessary, what impediments or annoyances require removal, what money or materials must be provided for such purposes. To form a court, ten days' notice to the owners or occupiers of lands within the district who are required to attend are necessary, except in a case of emergency, when it may be summoned by two commissioners immediately. It is the duty of the sheriff, on receipt of the precept of the commissioners, to summon a jury from the body of the county to attend in their court. Before any charge can be laid, the commissioners must further inquire, through means of the jury, by witnesses examined on oath before them, where it is that any defence is needed or any nuisance exists; and by whose neglect or default, if any, such things have occurred, and what parties are liable to contribute to the expenses of putting all in a proper condition. The general fundamental criterion by which the liabilities of parties to contribute must be ascertained, is the circumstance of their deriving benefit or avoiding injury from the works of sewers. When a party has been once presented as liable by a jury, he is presumed to continue liable during the existence of that commission.

The liabilities of parties to contribute may arise either by tenure, that is, by holding lands on condition of contributing to repairs of a bank, &c.; or by custom, or prescription, or by covenant. If a man holding lands charge them by covenant for himself and his heirs, and the lands descend to the heir, he is liable to their amount. Parties also may be charged by reason of their ownership of the bank, &c. requiring repairs, or because they have the use or profit of it; or because they are frontagers, that is, have lands joining the sea where the defences are needed. If no one appears to be liable for any of these causes, the expenses are then to be imposed on all the level, that is, all the land lying upon the same level. The reason for this imposition is, that all such land is liable alike to suffer by any injury to the defences against the sea, or by any defect in the drainage, and benefits alike by their restoration and maintenance; the whole of it therefore ought in justice to contribute towards the expenses incurred. Even in those cases where a special liability, such as has been above stated, rests on particular individuals, the whole level is still bound to contribute in any case of immediate danger; or where, in spite of the due repairs having been done by the party liable, an injury has occurred, by some sudden and inevitable accident, as an extraordinary tide or flood, or where the land liable is insufficient for the expenses necessary. Any new work also must be made and maintained at the expense of the whole level; and where extraordinary repairs are necessary to a great port of the sea, not the level only, but the whole county is liable. The parties liable within the level are all those who have within it any lands or tenements, or profits *à prendre*, such as rights of common, of fishery, &c., provided they receive benefit by the repair or injury by the non-repair; but a party may be exempted from contributing to a general assessment, on the ground of a special custom under which he is bound to do some particular act, such as repairs of a bank for the general service. The duty of the jury, after hearing witnesses, is to present the parties liable to repair; and in cases where the whole level is liable, to present the particular quantity of land or other profit that every one has who is liable within the level. It is sufficient to charge the ostensible owner or occupier. These presentments may be traversed or contested by the party whom they charge, and he may attempt to disprove the facts stated in them, and so show that he is not liable to the extent charged, or not liable at all. After the necessary facts are ascertained, the commissioners make a decree for the assessment of every person in the proportion to which he appears to be liable. The apportionment must be made by the commissioners: it is not sufficient for them to assess a certain sum upon a township or other district, leaving it to the parties themselves to apportion. Where, by reason of immediate necessity, works have been done without any presentment of a jury, the commissioners may afterwards make a rate to defray the expenses. In cases of emergency, the commissioners, by their order, may compel the service of carts, horses, and labourers: they may take soil, &c., and cut down timber within the level, if necessary for their purposes, subject of course to a proper remuneration, which may be recovered before them.

3. After an assessment has been duly made and demanded, the commissioners may by their warrant direct their bailiff to distrain and sell the goods of those who neglect to pay (the distress may be made without the district of the commissioners); or the party may be amerced for non-payment, or the lands themselves which are liable may be sold. In case of such a sale, a certificate of it must be made by the commissioners into Chancery. Constables within the district are bound to obey the orders of the commissioners. In cases where an obstruction or impediment has been, after presentment by the jury, ordered to be removed, the party causing it may be amerced; or if he is unknown, then the person who most suffers by the injury may be empowered by the commissioners to remove it; or the surveyor, after notice, may do what repairs, &c. are necessary, at the expense of the parties making the default: and for any act of negligence or default or misfeazance, an amercement may be imposed by the jury. The commissioners themselves may enforce parties to fulfil the duties lawfully imposed upon them. Thus they may fine a juryman who refuses to act, or a sheriff who fails to summon a jury; and they may maintain order in their court by fining and imprisoning those persons who attempt openly to disturb it.

If the commissioners make an order in a matter out of their jurisdiction, the order may be removed by certiorari into the court of King's Bench, and there quashed; and the commissioners are fineable for contempt if they proceed after a certiorari has been allowed. But a certiorari cannot be demanded of right; it is within the discretion of the court of King's Bench to refuse it, and the impropriety of the order must be made out very distinctly before a certiorari will be granted. Where the order is for repairs, and is made upon an inquisition before a jury who find that a party ought to repair, the court will not proceed in the matter unless the party charged consents to repair in the mean time. If it afterwards appears that he ought not to repair, he will be entitled to reimbursement, which may be awarded to him by the commissioners. An order which is good in part may be confirmed for so much, although it is quashed for the remainder.

An action may be brought against the commissioners for anything done by them beyond their authority. They may sue and be sued in the name of their clerk, who, nevertheless, may be a witness for them. (Callis *On Sewers*; 4 *Inst.*; Comyns's *Digest*, 'Sewers;' Viner's *Abr.*, 'Sewer.')

The sewers of the city of London and its liberties are under the care of commissioners appointed by the corporation, who were first empowered to make the appointment by the 19 Chas. II., c. 31, the act for rebuilding the city after the great fire. They were entrusted with this power by that act for seven years only. A few years afterwards it was made perpetual; and by 7 Anne, c. 9, the commissioners of sewers for the city of London were invested within the city and its liberties with all the authorities possessed by the ordinary commissioners elsewhere.

SEWERS. In treating on the construction and management of sewers, the name will be used in the limited sense in which it is commonly applied to the subterraneous passages formed for the drainage of towns; and the sewers of London, being the most important, and those respecting which most information can be procured, will form the principal subject of this notice.

Covered drains or sewers of great size, and of very solid construction, still exist under the streets of some antient Roman cities, and especially of Rome itself. The cloacæ or sewers of Rome are so capacious that barges are said to have been floated through them: and their magnitude has led to the conjecture that, although their origin is usually attributed to the time of Tarquin, they are in reality the remains of some older city; their dimensions being considered disproportionate to the extent of the then infant city of Rome. For a particular account of the existing remains of these works, see CLOACÆ, vol. vii., p. 268.

In modern times the sewers of London stand unrivalled for extent and excellent construction, although much yet remains to be done to render them adequate to the necessities of an immense and constantly increasing population. It will be seen from the preceding article that the early legislative enactments relating to sewers, so far as they provide for drainage at all, do so for the drainage of the surface only; while, from the practice so common in London, of building not only cellars, but habitable apartments also, much below the level of the ground, convenient means of drainage to a considerable depth are essential to the health and comfort of the inhabitants, and the dryness and stability of the houses themselves. Although additional powers have been from time to time conferred upon some of the commissions by which the sewage of the metropolis is managed, this defect is far from being completely remedied. A little consideration as to the circumstances under which the duties of the commissioners have gradually changed and extended, will tend to account for many of the defects of the existing system, which deserves admiration for its comparative excellence, rather than calls for any expression of dissatisfaction at its admitted defects. Mr. Walker, the engineer, in evidence before a parliamentary committee in 1834, stated that when, in the previous year, some French engineers were sent over to England by their government, nothing seemed to attract their attention more than the sewage of London, the drainage of Paris being a subject then under consideration; 'but,' he adds, 'their ideas of the proposed drainage never extended to more than taking away the surface drainage, and they seemed astonished when I told them that the water from our lowest cellars drains into those great sewers.' It is very curious to trace the effect of the extension of population in and about London in converting what were, a few centuries ago, strea of pure water, into receptacles and channels for the filth and refuse of a densely inhabited district, until they have become so offensive, and so inadequate to the offices required of them, as to render necessary the substitution of deep and wide subterraneous channels, or arched sewers, for the once healthy, but now pestilential rivulets. This has been done by the writer of a paper in Knight's 'London' (No. XIII.), to which we are indebted for the following particulars respecting the watercourse now known as the Fleet Ditch or Sewer, which affords the most striking example of these changes. Stow tells us that 'Antiently, until the time of the Conqueror, and two hundred years later, this city of London was watered (besides the famous river of Thames on the south part) with the river of the Wells, as it was then called, on the west; with a water called Walbrook running through the midst of the city into the river of Thames, severing the heart thereof; and with a fourth water, or bourn, which ran within the city through Langbourn Ward, watering that part in the east. In the west suburbs was also another great water, called Oldborn, which had its fall into the river of Wells.' In this passage, which enumerates the principal natural water-courses of the old city, the Fleet is designated by a title indicative of the 'choice fountains of water, sweet, wholesome, and clear,' which, from the northern suburbs of the city, contributed their tributary rills to the main stream, which descended from the high ground about Hampstead. However clear and sweet this river may once have been, it was early rendered otherwise by the extension of population on its banks. The paper alluded to above tells us that 'So early as 1290 the monks of White Friars complained to the king and parliament that the putrid exhalations arising from it were so powerful as to overcome all the frankincense burnt at their altars during divine service; and even occasioned the deaths of many of the brethren.' Many attempts were made to cleanse the Fleet river, and restore it to its antient condition of utility as a navigable stream; but they proved unavailing, and the stream which formerly conducted vessels with merchandize as far as Fleet Bridge and Old Borne (now Holborn) Bridge, if not further, became, in the language of Pope,

> 'The king of dykes! than whom no sluice of mud
> With deeper sable blots the silver flood.'

The total surface which is drained into this stream in the Holborn and Finsbury districts of sewage is stated to be about 444 4 acres, of which about 1788 acres are now covered with streets and houses; while in 1746 the surface so built upon was only about 400 acres. This increase of buildings, besides greatly augmenting the ordinary drainage from the surface, by reducing its absorption, has rendered necessary some provision for carrying off the refuse water and filth from thousands of habitations. The Fleet dyke or ditch has therefore been, for several years past, in course of conversion into a great arched sewer, of which only a small portion now remains incomplete. In 1826 it was determined to enlarge this sewer for a length of nearly 16,000 feet, from Holborn to Kentish Town;—the expense was estimated at 46,682*l.* The greater part of this work has been already executed, the remaining length being chiefly in the direction of the intended new street north of Farringdon Street. The commissioners make it a principle, wherever it is practicable, to form their covered sewers under the pavement of streets; a circumstance which occasionally deters them from covering sewers in districts where the arrangement of the streets is not fully decided on, although the increase of population may render the open channels a great nuisance.

The names of the seven trusts or commissions into which the sewers of London and its suburbs are divided, and some further particulars respecting them, have been given in a previous volume. [LONDON, vol. xiv., p. 123.] It has long been considered that the system of management is capable of considerable improvement; as the want of uniformity of plan, and of cordial co-operation in the several districts, is liable, in various ways, to lead to inconvenience. A select committee of the House of Commons was appointed in 1834 'to inquire into the state of the law respecting sewers in and near the metropolis, and into the administration of the same by the various Boards of Commissioners of Sewers; with a view to suggest such amendments in both as shall be deemed advisable;' and this committee, after a careful investigation, pronounced their opinion that the law is especially deficient in three points. These defects are, 1st, a want of uniformity—the law itself varying in different districts; or if not so, being variously interpreted by their respective commissions; 2nd, the want of publicity and responsibility—there being some of the trusts in which the courts are not open to the public, and where the right of the ratepayers to inspect the accounts is not admitted; and, 3rd, equality of rateage, with inequality of advantages—it being the usual practice to rate all houses which either receive a benefit from the sewers or avoid a damage. On this system very few houses are exempt, as all may be considered to derive benefit more or less from the surface drainage of the streets. So long as merely the surface drainage of the town was attempted, this principle might be considered equitable; but as the sewers are now used for other important purposes, and it is highly desirable that every house should have an underground communication with them, it appeared to the committee unjust that the same rate should be levied upon houses possessing this advantage, and upon such as neither have it, nor, without great additions to the present sewage, can be supplied with it. In some cases the commissioners appear not to be possessed of necessary powers for making new sewers, or even covering in existing open sewers; while the law provides no means of compelling the builders of new streets to provide them with proper drainage, or even of enforcing communication with a sewer when made. A bill for regulating the drainage of towns was introduced in the last session (1841), which, if passed, would have done much to remove these defects; but it was lost in consequence of the abrupt termination of the session. A striking illustration of the evils arising from the want of unity of plan among the various commissions is afforded by the fact stated in evidence before the committee, that the improvement and enlargement of the sewers in the Holborn and Finsbury divisions, which communicate with the Thames through those of the City of London commission, occasioned so great an influx of water to the latter, that they became totally unable to discharge it; and consequently their contents were, during heavy falls of rain, forced into the neighbouring houses. This circumstance has rendered necessary the construction of enlarged sewers through the city at great expense; 'but,' as observed in the Report, 'if anything like combination had existed previously, the improvements would have been carried on simultaneously, and the inconvenience would never have occurred.' Notwithstanding the liability of the present system to abuse, the committee reported that the laws appeared to have been, of late years, administered with good faith and integrity on the part of the commissioners; and their investigation did not lead them to recommend a consolidation of the various trusts into one—a measure which had been suggested as a probable improvement. The evidence given on this occasion proved that much was being done to remedy the defects of the sewage, both by deepening, enlarging, and otherwise improving old sewers, and by making new ones. Mr. Daw, chairman of the City of London commission, stated that full one-third of the sewers in the city had been made in the ten years preceding 1834. A return made by the officers of the Westminster division shows that, between 1807 and 1834, there had been built, within the Ranelagh Level,[*] 2692 feet of open and 6886 feet of covered sewers, making a total length of 9578 feet, at the cost of the commissioners; while the length made during the same period by private persons was 91,708 feet. From a letter printed in the Appendix to the Report of the Committee, respecting the district drained by that portion of the Fleet ditch which is within the jurisdiction of the commissioners for the Holborn and Finsbury divisions, it appears that no less than 31,000 feet of new sewers were made in that district between 1822 and 1831, at a cost of more than 23,000*l.* Since the year 1834, improvements have been going on rapidly in some districts. In the Tower Hamlets division, as appears by the evidence of the surveyor before the Select Committee of the House of Commons on the Health of Towns, in 1840, nearly 25,000 feet of new sewers were proposed in 1834 or 1835, of which four-fifths were completed by 1840. There do not appear to be published data from which the total extent of the sewers in the metropolitan districts can be ascertained; but by the courtesy

[*] *Level* is an arbitrary term, originally applied to the district drained by a particular sewer; although there are now several outlets for the drainage in many districts that bear the name of levels. In the Ranelagh district, for instance, besides the principal outlet, which is called the Ranelagh sewer, the Commissioners' map shows six minor openings into the Thames, three of which receive the sewage from several branches.

of Mr. Roe, surveyor of the Holborn and Finsbury divisions, we are enabled to state that the total length of the main covered sewers in those districts, down to April, 1841, was as follows:—

	Feet.		Miles.
Holborn division . .	217,566	or about	41¼
Finsbury division . .	220,885	. . . .	41¾
Total .	438,451	. . . .	83

Of these main sewers nearly one-half have been made within the last twenty years, and 10¾ miles in the three years from January, 1838, to December, 1840. In addition to these, there are 16 miles of smaller sewers to carry off the surface water from the streets and roads, and 254 miles of drains leading from houses to the main sewers. (*London*, No. XIII., p. 231.)

While such facts as the above show that much has been done of late years in extending the benefits of underground drainage, there are still many densely peopled districts, both in London and in some of the principal provincial towns of the kingdom, which are either entirely without sewers, or in which the sewage is extremely defective. The witnesses examined in 1840 by the Committee on the Health of Towns brought forward numerous instances of this kind, in which the worst effects were produced on the health and morals of the people by the contaminated atmosphere and the filthy condition of the houses in which they are compelled to live. A Report on the Sanitary State of the Labouring Classes, by Dr. Southwood Smith, expresses a very strong opinion as to the injurious effect of deficient drainage; and so intimate does that gentleman conceive its connection to be with the presence of disease, that he observed, in his evidence before the committee alluded to, 'if you were to take a map and mark out the districts which are the constant seats of fever in London, as ascertained by the records of the Fever Hospital, and at the same time compare it with a map of the sewers of the metropolis, you would be able to mark out invariably, and with absolute certainty, where the sewers are, and where they are not, by observing where fever exists; so that we can always tell where the commissioners of sewers have not been at work by the track of a fever.' For instances to bear out this assertion the reader is referred to the evidence itself, in which many scenes are described that are too filthy and disgusting for repetition, and abundant proof is given that the evils complained of are as debasing to the character as they must be destructive to the health of the poorer classes; for, as remarked by Dr. Arnott, 'where filth is unavoidable, it makes people careless of making a little addition to it; it does not shock their feelings as if all was clean.'

As sewers are, from their peculiar situation and use, more difficult to examine and repair than many other structures of brickwork, while a defect may be productive of very serious injury before it attracts notice, it is especially desirable that they should be constructed in the most perfect and durable manner; while the necessity of providing for the passage of water from existing branches, and from such as may be constructed at a future time, requires great care in adjusting the dimensions, inclination, and level. All the sewers constructed by the metropolitan commissions of late years are of such dimensions as to allow a man to pass through them, for the purpose of inspecting or cleansing them. From a statement in the Appendix to the Report of the parliamentary committee of 1834, it appears that the smallest sewers in the City of London division are about four feet three inches high by two feet three inches wide, the dimensions being increased, according to circumstances, up to eight feet six inches by seven feet, which are the general dimensions of the new sewer from Moorfields to London Bridge, although at the mouth it is increased to ten feet by eight feet. The water brought down by the Fleet Ditch is conducted from Holborn Bridge by two sewers, from twelve to fourteen feet high, and six feet six inches wide, one on each side of Farringdon Street. These sewers unite, towards the mouth, into one passage about eighteen feet by twelve; and even that, the surveyor states, is sometimes insufficient to carry off the water. When a storm occurs at high-water, the quantity brought down by the Fleet Ditch will, he says, raise the water in the lower part of the sewer five feet almost instantaneously; and under such circumstances, the water has been occasionally forced up through the communicating drains, so as to flood the surface. In the district under the management of the Westminster commission, the common sewers are built of the form represented by the annexed transverse section, which represents, on a scale of a quarter of an inch to a foot, a sewer of the larger sort, the greatest height being five feet six inches, and width three feet. Smaller sewers are made of the same form, but only five feet high, and two feet six inches wide. The regulations for building sewers, issued by the commissioners, require that the bricks used be 'good, square, hard, sound, and well-burnt stock bricks, and be properly laid in well-compounded mortar, made of one part of good strong stone lime and two parts of clean river sand; the workmanship to be of the best description, the bricks of each arch to be well bonded, and the bricks of the arch at the bottom of the sewer to be laid close at the top edge, and to an even curvature on the upper surface, bedded in mortar and grouted.' It is further ordered that when Roman cement shall be used in the works, 'it shall be of the best quality, and shall not be mixed with more than one-half of clean river sand.' This form of sewer has been, we believe, generally adopted in London; but Mr. Roe, surveyor to the Holborn and Finsbury commission, who has introduced several important improvements in the construction and management of sewers, has suggested that it is a form not calculated to give the greatest strength, and states that in some cases the sides have given way to the pressure of the earth behind them. He therefore prefers an oval form, as represented in *Figs*. 2 and 3, which are copied from the regulations recently issued by the commissioners for the construction of new sewers and drains. These are drawn to the same scale as *Fig*. 1. The part in which the joints are marked in the cut is, according to the directions, to be worked in blocks with cement.

Fig. 1.

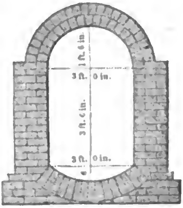


Fig. 2.

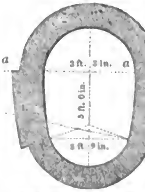
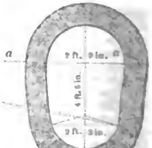


Fig. 3.



The sides of these sewers form curves of large radius, struck from centres on the line *a a*; the radius for the larger size being about thirteen feet, and that of the smaller size in proportion.

The regulations of this commission require that every main or leading sewer 'which may receive the sewage from streets and places containing more than two hundred houses, shall be of an oval form, five feet in height, and three feet in width in the clear; the invert thereof to be worked one brick in substance, and the springing walls thereof to be worked one brick and a half in substance, and bonded, and the crown thereof one brick in substance, in two separate half-bricks,' conformably with the transverse section copied in the preceding cut, *Fig*. 2. All branch sewers which may receive the sewage from streets containing less than two hundred houses, are required to be four feet six inches in height, and two feet six inches in width in the clear; the whole being worked one brick in substance, the bottom and springing walls being bonded, and the crown worked in two separate half-bricks. The section of this, which is called the second size, is represented in *Fig.* 3. Mr. Roe states, in the paper in which this new form of sewer is recommended, that its adoption would effect a saving of one shilling and sixpence per lineal foot in sewers of the first size. The expense of building sewers of course varies greatly, according to their depth and other contingent circumstances; but in 1834 (before Mr. Roe's improvements were introduced), the average cost of the larger sewers in the Holborn and Finsbury divisions was stated to be from twenty to twenty-five shillings per foot, and of the smaller sewers from twelve to fifteen shillings per foot. In the Tower Hamlets district, the ordinary dimensions, as stated to the committee of the House of Commons in 1834, are four feet six inches by three feet for the larger, and four feet by two feet six inches for the smaller sewers. The inverted arch which forms the bottom of a sewer, besides adding to its strength, is useful in increasing the force of the current, and enabling it to carry away the ponderous matter that would otherwise settle and choke up the sewer. In the evidence before the committee on the Health of Towns (p. 127), Mr. Newman, one of the surveyors in the Surrey division, stated that the badness of the soil in that district, and the existence of quicksands, increased the difficulty and expense of constructing the sewers, and rendered necessary the adoption of cast-iron bottoms.

The inclination of sewers must vary greatly in different districts, but should always, if possible, be sufficient to enable the water to run freely, and to carry off the solid matter that usually enters with it. The regulations of the Holborn and Finsbury commissioners require that the inclination 'be not less than one-fourth of an inch to every ten feet in length, and as much more as circumstances will admit, in those portions that are in a straight line; and double that fall in portions that are curved.' Those issued by the Westminster commission in 1836, state that the current required for sewers, in all cases, is one inch and a quarter to every ten feet in length; but probably this has been ascertained to be a greater inclination than is necessary, as the more recent regulations order 'that the current of all sewers to be built be regulated by the commissioners according to the surface required to be drained,' without specifying any particular inclination. These also require that, where the situation will admit of ample fall and depth of sewer, there shall be at least three feet of depth between the upper part of the crown of the arch and the surface of the road. In some cases it is very difficult to obtain sufficient inclination in a sewer, and still to make it deep enough to drain the basement story of neighbouring houses; which may be readily conceived from the fact that some parts of London are below the level of high water. Considerable portions of the district comprised in the Surrey and Kent commission of sewers, by which the drainage of the whole of London south of the Thames is effected, are below that level; and the surveyor of the Tower Hamlets commission states that in some parts at Wapping the pavement is five feet below the high-water mark of the Thames. (*Report on Health of Towns*, p. 125.) The greater part of the district drained by the Blackwall or Poplar commission would be inundated but for the river walls; so that in this division the duties of the commissioners consist, as intimated by the old laws relating to sewers, as much in the maintenance of embankments as in making provision for drainage. To prevent the tide from entering sewers that drain low ground, it is necessary to close their lower ends with heavy flaps, which are opened by the attendants, or flap-keepers, at proper times, so as to allow free exit for the sewage at low-water. Wherever it is practicable, new sewers are built at a considerable depth from the surface. The depth of that in Watling-street, in the City of London, which is an extraordinary case, is from thirty-three to thirty-five feet. Some difficulty not unfrequently occurs in crowded districts, where deep and capacious sewers are especially needed, owing to the danger attending their construction. In many cases, particularly in the older streets of the city, it is necessary to shore up the houses by a massive frame-work of timber, to prevent their falling while the sewer is in progress; and in some instances it has been considered unadvisable, solely on this account, to attempt their construction, even where they were much needed. The want of sewers in some parts of London obliges the inhabitants to use force-pumps to relieve their cesspools; a practice which, besides being very expensive, is injurious to health, as the filthy water so pumped out runs along the open gutters until it reaches a gully-hole. This operation is performed at night, by which the evil is rendered less apparent; and it has been proposed, in some cases, to lay an iron pipe beneath the foot pavement to carry off the water so pumped out, that it might not run on the surface.

It is highly desirable, where a sewer must deviate from a straight line of direction, to effect such deviation by means of regular curves; and also to make branch sewers enter the main line by a curved instead of an angular junction. Mr. Roe ascertained, by experiment, that the time occupied in the passage of an equal quantity of water along similar lengths of sewer with equal falls, was as follows:—

Along a straight line	90 seconds.
With a true curve	100 „
With a turn at right angles . .	140 „

It is therefore evident that the occurrence of angular or ill-formed turns in a sewer must have a similar effect to diminishing its capacity, as such parts of the sewer will not pass so much water as the straight parts; and it also has the disadvantage of occasioning the deposition, in the form of sediment, of matter that would otherwise pass off with the water. This evil may be met by giving a greater fall to curved than to straight portions of the sewer. The new regulations of the Holborn and Finsbury commissioners, in which the improvements of Mr. Roe are embodied, require that the curves in sewers passing from one street to another, or where a turn is required, shall be formed with a radius of not less than twenty feet, and also that the inclination or fall shall be increased at the junction.

Where private drains are to be laid into a sewer for the purpose of draining houses, it is necessary that the lowest pavement or floor of the building be at least four feet above the level of the sewer, measuring to the bottom of the side wall, or commencement of the invert; because the house would otherwise be liable to be flooded with water from the sewer, when unusually full. The regulations for private drains, issued by the Westminster commission, require that the bottoms of such drains shall be twelve inches above the bottom of the sewer with which they are intended to communicate, and recommend that they have a fall of at least a quarter of an inch in a foot. This fall, in a length of sixty feet, amounts to fifteen inches, by adding to which thirteen inches for the height of the drain and brick arch over it, eight inches for the depth of ground and paving over the upper end of the drain, and twelve inches between its lower end and the bottom of the sewer, we obtain the necessary total fall of four feet. The Holborn and Finsbury commissioners require a space of two feet between the bottom of the drain and the bottom of the sewer; but the total difference of level between the sewer and the basement floor is only two inches greater than that mentioned above; the prescribed fall being only a quarter of an inch in a yard, or five inches in a length of sixty feet. To prevent injury to the sewers, it is always required that the brick rings at the junctions of private drains, and about three feet of the drains themselves, shall be made by the commissioners; a fixed price being paid to them by the individual for whom the drain is constructed. The metropolitan commissioners of sewers are required to furnish builders, on application, with information as to the lowest level to which they can supply the means of drainage; but, under the present state of the law, they have no power to prevent the excavation of ground for buildings, or the formation of cess-pools, to a greater depth than can be drained by the sewers; although they may refuse permission for the construction of private drains opening into the sewer in such cases. The disinclination evinced by many proprietors of houses to avail themselves of the facilities offered by the construction of new sewers, for improving the drainage of their property, is truly surprising, and shows how imperfectly the advantages of good sewerage are appreciated. A remarkable case was mentioned to the committee on the Health of Towns, in which a new sewer nearly a mile and a half long had been made, in the parish of Camberwell, on the urgent application of the inhabitants, and yet only one application had been made for a private drain in the whole distance. Drains leading from private houses are usually of a circular form, and nine inches in diameter, though some are of greater size. In this, as in almost every other point of detail, the various metropolitan commissions are far from being uniform. While the Holborn and Finsbury commissioners will not allow, except in special cases, a private drain of more than nine inches in diameter, those for the Tower Hamlets division allow nothing under twelve inches, and admit drains of fifteen or even eighteen inches diameter.

The construction of gully-holes and shoots for conducting the surface drainage of the streets into the sewers, and a variety of other matters, vary considerably in the different commissions. It has been usual in all, until very recently, to make apertures or *man-holes* at convenient distances, to enable persons, when necessary, to enter and cleanse the sewers. In the regulations of the Westminster commission, it is ordered that these apertures be formed at, or near to, every intersection of the sewers, and also that they be at distances not exceeding 180 feet from each other. They are built in the form of oblong shafts of brickwork, up to within about eighteen inches of the surface of the road, and covered with cast-iron plates, over which the roadway is made good. The inconvenience attending the use of these apertures, in order to open which it is necessary to break up the carriage-way, might be avoided by the general adoption of side-entrances, which form an important feature of the improved system now being introduced in the Holborn and Finsbury commission. These are passages extending from the side of the sewer to the foot-pavement, through which they may at any time be entered by unlocking and opening a cover or trap-door, consisting of pieces of flag-stone mounted in an iron frame. When a person enters the sewer by one of these openings, the cover is held open by a self-acting catch, and an iron grating, which admits light and air, rises into its place, and serves to prevent any passenger from accidentally falling in. It is proposed in some cases to combine the side-entrances with the gully-holes, by which some expense may be saved. The advantages of an easy access to the sewers at all times are very great; and the positive saving of expense by the adoption of this system is expected, as appears from the Report in which it is recommended, to be considerable. It is proposed that there shall on an average be one side-entrance to every six hundred feet of sewer.

The last-mentioned improvement is intimately connected with another, which promises to be of great value—a method of cleansing sewers by using water in *flushes*. A great quantity of solid matter enters the sewers with the water which they are intended to carry off; and as their current is usually very trifling, it is deposited in the form of a sediment. This takes place especially at the points of junction of branch sewers, gullies, and private drains; and it has often happened that the deposit has gone on accumulating until it has reached the level of the private drains, the consequent choking up of which has given the first intimation of the state of the main sewer. Besides the injurious effect of this accumulation of filth upon the health of persons residing near the sewer, such a state of things is productive of great expense, it being sometimes necessary to break up the road, and open and rebuild both the sewer and, occasionally, the drains opening into it. But the evil does not rest here; for it has been a common practice to spread the deposit of filth on the surface instead of carting it away, whereby its noxious effluvia have become productive of disease to the neighbourhood. Although in general the current of water in the sewers is not sufficiently rapid to carry off this solid matter, Mr. Roe, conceiving that it might be made so by damming it up, and then letting it off in flushes, tried a series of experiments on the velocity of water in sewers when dammed up to various heights, by which he found that he could, by a head of water varying from ten inches to four feet, obtain a velocity of from thirty to eighty-six inches per second. The power of running water at various velocities has been treated of in the artice ALLUVIUM [vol. i., p. 357], where it is stated that a velocity of three inches per second is sufficient to enable a current of water to tear up fine clay; and that a stream running at the rate of three feet per second will tear up beds of loose stones of the size of an egg. It is therefore evident that, by a moderate head of water in a sewer, a current may be produced of sufficient force to tear up and carry away a considerable deposit of sedimentary matter. The average annual deposit is stated to be nearly an inch and a half in thickness—a quantity which might be readily removed by flushing once a-year only; but far better by repeating the operation, as it is proposed to do, three or four times in a year, which will prevent its ever accumulating in considerable quantity. To show the effect of the operation in practice, we quote the particulars of three experiments, from a report presented by Mr. Roe to the commissioners:—

1st Experiment. Water backed up 70 feet; head, 13 inches; quantity, 26 hogsheads; which, when let off, cleared away rather more than 1½ inches of deposit from 370 feet of sewer, having a fall of a quarter of an inch in each 10 feet, and being the whole length that needed cleansing.

2nd. Head of water, 18½ inches; quantity, 45 hogsheads; cleared away 1½ inch of deposit from 300 feet of sewer; part of the bottom on a dead level.

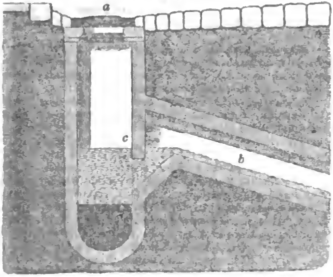
3rd. Head of water, 10 inches; quantity, 20 hogsheads; deposit heavy; flush cleared away 1½ inch from 330 feet of sewer.

The necessary head of water is produced by simply accumulating the ordinary contents of the sewer, which may be done either by a cast-iron gate, fitting closely to a framework built into the sewer, and rising to the height that the head is required to be, or by a drop plank or gate of the same material, sliding up and down in nearly vertical grooves. In either case the apparatus may be managed, by means of the side entrances before alluded to, with the greatest facility. The drop plank may, it is stated, be drawn up in two seconds and a half, and the gate may be thrown open in less than one second; and, as the height of each head is regulated by the level of the private drains near it, no injury is done if the water rise to the top of the gate, so as to run over it, before the attendant is ready to let it off; so that one person is enabled to set a number of stop-gates, and return to let them off in succession. In the report alluded to, Mr. Roe gives a detailed calculation to prove the superior economy of this plan of cleansing, and concludes his recommendation of it by observing 'that irrespective of any saving to be effected by flushing the sewers with water, he considers that the prevention of a large quantity of foul deposit from remaining in a state of fermentation for years together beneath the streets, and the consequent removal of a great cause of offensive effluvia, together with avoidance of large quantities of slop being laid out on the surface (as is the case in the ordinary mode of cleansing), would be benefits of such worth as to warrant the utmost use of stop-planks and water, for keeping sewers free from deposit.' The ordinary run of water in the sewers has hitherto been found sufficient for the purpose; but in case of its proving otherwise, a supply of water for flushing might be readily procured from the water companies.

Of the numerous plans that have been suggested for improving the sewage of the metropolis, a few claim a brief notice. Among these is that brought forward a few years since by Mr. John Martin, of which the particulars are given in the Report of the Select Committee on Sewers, in 1834, and were also published in the form of a pamphlet. The main feature of this plan was, that the water collected in the sewers should not be emptied immediately into the Thames, but into spacious receptacles near its banks, in which the solid matter might subside, so as to become useful as manure. To effect this it was proposed to construct a great sewer, principally of iron, along each bank of the river; into which the existing sewers should empty themselves, instead of into the river itself. Mr. Cubitt stated to the committee on the Health of Towns that he did not think Mr. Martin's plan went far enough: and that the sewage should, in his opinion, be conducted several miles below London before it is allowed to enter the river; so that it might not be liable to be driven back to the town by the incoming tide. The great importance of the object aimed at in this suggestion will be admitted by all who reflect that a great portion of the inhabitants of London are supplied with water from the Thames, which is necessarily contaminated, under the present system, by the influx of the entire sewage of the metropolis.

Very different opinions have been expressed as to the advisability of preventing the escape of the effluvia of sewers by the gully-holes; and it has indeed been contended that they are by no means so noxious as to render such a measure desirable as a sanitary precaution. Although the evidence laid before the committees on Sewers and on the Health of Towns tends generally to prove the injurious character of such exhalations, it does not appear from it that the persons employed in and about the sewers are a particularly unhealthy class of men; and even open sewers, which are almost universally condemned, do not appear to be always productive of visible unhealthiness. The surveyor of the Tower Hamlets division says, in his evidence before the latter committee (p. 125), 'in Hackney, which is one of the most healthy districts, we have more than three miles of open sewers; it is the filth of the inhabitants, more than anything else, which affects their health.' The degree of insalubrity occasioned by the exhalations from sewers, whether closed or open, depends much upon the velocity of their current, and may, under some circumstances, be trifling, although in others it is an evil that demands remedy. It is absolutely necessary to provide some means for the escape of the gases engendered in the sewers, and this is commonly done by the gully-holes in the streets; the entrances to private drains being usually, in the better sort of houses, secured by an apparatus called a stink-trap, which prevents the escape of the effluvia. But even the vent provided by the gully-holes is sometimes insufficient; and the gases not unfrequently accumulate and explode in the sewers, thereby endangering the men whose duty it is to enter them. Mr. Fuller, a medical gentleman, in presenting a plan for ventilating sewers to the parliamentary committee of 1834, stated that of all the cases of severe typhus that he had seen, eight-tenths were in houses either untrapped from the sewers, or which, being trapped, were situated opposite to gully-holes; and he mentioned cases in which servants sleeping in the lower rooms of houses so situated were invariably attacked with typhus fever. Instances were also adduced in which it had been found necessary either to trap or to remove gully-holes in the vicinity of butchers' shops, owing to the injurious effect of the effluvia upon the meat. Many varieties of air-traps or stink-traps have been suggested, and tried on a limited scale, for diminishing this evil. A very simple plan, introduced by Mr. Cuff, is represented in section by *Fig.* 4. In this cut *a* represents the grating, which is imbedded, as usual, in the pavement of the street, and *b* is the passage leading to the sewer. The vertical shaft or well is carried down below the level of this passage, the bottom being formed into a receptacle for the solid matter that enters with the water; and which, being in a quiescent state, and constantly covered with a considerable depth of water, is not likely to emit any injurious smell. This receptacle may be cleared out once a month, or oftener, the operation being the work of a few minutes only; and Mr. Cuff proposed, in some cases, to have an iron vessel fitting the bottom of the well, so that it might be drawn up by a crane attached to the cart that carries away the solid matter, and returned to its place when emptied. The curtain-wall, or dipping-valve, at *c*, extends a little below the level of the entrance to the sewer, so that while it allows water to flow freely into the sewer when it has filled the well to the level of the inclined passage, it effectually prevents the escape of air from the sewer to the gully-hole. It is a defect of this, in common with many other kinds of trap, that in dry weather the water sometimes becomes too low to prevent the passage of air; but this inconvenience admits of easy remedy. The recent successful introduction of flushing renders one feature of the plan,—the exclusion of solid matter from the sewers,—less important than formerly. Mr. Cuff stated, in 1834, that his traps had been in use in the Tower Hamlets division for seven years, notwithstanding the opposition of the commissioners; the Pavement Trust having, in that district, an independent power over the gully-holes. They have also been used in St. James's Park, Whitechapel, and other parts of London; and, we believe, in several provincial towns.

Fig. 4.



Before any system of traps can be extensively adopted with safety, means must be provided for producing ventilation in the sewers. The plan recommended by Mr. Fuller was to have a large furnace, with a high chimney, erected as near as convenient to the highest point of every main sewer, and so connected with it that the fire should be supplied with air from the sewer only. The lower end of the sewer was to be closed with a trap that would allow water, but not air, to pass; so that air could enter only at the gully-holes, of which a sufficient number should be left open to supply the draft of the furnace, all the rest being trapped. By carefully adjusting the number and situation of the open gully-holes, it was conceived that a sufficient current of air might be produced in all the sewers to prevent any emission of foul air into the streets or houses, as the open gullies would have a current setting into instead of escaping from them; while the air drawn from the sewers by the furnace would be purified by passing through the fire, and would finally escape at such a height as to avoid any risk of becoming a nuisance. A similar plan has been suggested in America, and also in Paris. (Gill's *Technical Repository*, vol. iii., p. 85; and vol. vii., p. 55.) The opinions of scientific men as to the practicability of introducing such a system of ventilation on a large scale, and at a sufficiently moderate expense, are not very decided; but the importance of some such improvement is obvious. For further particulars respecting Mr. Fuller's plan, and experiments to ascertain the necessary dimensions of the chimney, &c., the reader is referred to the Report of the Committee on Sewers, especially to the evidence of Messrs. Fuller and Walker. It has been suggested that occasionally the large fires used in manufacturing establishments might be taken advantage of in introducing such a system of ventilation.

The great importance of having every drain that enters a dwelling-house secured by an air-trap may be conceived from the fact stated by Mr. Fuller, that in several houses in which he measured the current of foul air emitted from the drains, he found it set into the houses at the rate of from six to ten feet per second. Subjoined are sectional representations of two simple kinds of trap suitable for domestic use, the action of which needs but little explanation. That represented in *Fig.* 5, which is very commonly used in London, is made entirely of metal, and is intended for use in sinks; the apparatus being fitted into the stone, so as to be flush with, or sunk a little below, its upper surface. The grating, to which the inverted cup that acts as a dipping-valve is attached, and which is distinguished by a lighter colour in the engraving, may be screwed out when necessary, in order to cleanse the trap. The water, after passing under the edge of the dipping-valve, and rising to the top of the vertical pipe, runs off through it to the drain. The second plan, shown in *Fig.* 6, is copied from Hebert's *Engineer's and Mechanic's Encyclopædia*, art. 'Air-trap.' This trap is adapted for insertion in kitchen floors of stone, brick, or paving-tiles. It is made of common red pottery, and occupies a space of nine inches square, the same as a common paving-tile.

Fig. 5.

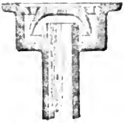
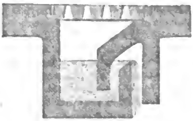


Fig. 6.



A patent was taken out in 1822, by Mr. Williams, for a plan which he proposed in order to remedy the inconvenience of breaking up the streets in order to repair or cleanse the sewers, to lay pipes for water or gas, &c. This desirable object was to be effected by building a substantial tunnel, or *subway*, along the centre of every street, the subway being lighted and ventilated by gratings in the carriage-way, and entered by side passages at convenient intervals. The sewer was to be either alongside or in the lower part of the subway, opening into it by apertures which, when closed, would not permit the escape of effluvia; and the iron pipes for the supply of water and gas were to be laid along the sides of the tunnel, or suspended by iron straps from the arch. Such a plan would offer great facilities for effecting any necessary repairs or laying new pipes; and would also favour the improvement of street pavements, as their frequent disturbance under the present system tends to discourage the adoption of durable methods of paving, and occasions constant and enormous expense. Mr. Williams's plan is fully detailed in an octavo volume published by him in 1828, entitled 'An Historical Account of Subways in the British Metropolis,' &c.

(*Reports of the Parliamentary Committees on Sewers and on the Health of Towns: Papers printed for the Commissioners of Sewers of the Westminster and Holborn and Finsbury Divisions*; &c. &c.)

SEXAGE'SIMA, the second Sunday before Lent, or the next to Shrove Tuesday; so named, as being, not exactly, but about the sixtieth day before Easter. Brady, in his 'Clavis Calendaria,' vol. i., p. 175, says, 'The name of the first Sunday in Lent having been distinguished by the appellation of Quadragesima, and the three weeks preceding having been appropriated to the gradual introduction of the Lent fast, it was consistent with propriety to call the three Sundays of these weeks by names significant of their situation; and reckoning by Decades, the Sunday preceding Quadragesima received its present title of *Quinquagesima*, the second *Sexagesima*, and the third *Septuagesima*.

SEXAGESIMAL, a name given to the system of reckoning in which each unit is the sixtieth part of the preceding, to which, in our day, we are only accustomed by the method of measuring angles and time. The Greeks, and Ptolemy in particular, brought this method into use in astronomical matters, and their successors seem to have attempted to make it a general mode of reckoning. There exist treatises of arithmetic fashioned on this system, one for instance by BARLAAM.

In the sexagesimal arithmetic, $17\ 26'\ 48''\ 53'''\ 9^{\text{iv}}$ stands for 17 units + 26-sixtieths of a unit, or 26 minutes or *scrupula prima* [SCRUPLE] + 48-sixtieths of a minute, or 48 seconds or *scrupula secunda* + 53-sixtieths of a second, or 53 thirds or *scrupula tertia* + 9-sixtieths of a third, or 9 fourths or *scrupula quarta*.

Addition and subtraction are easy enough in this system; multiplication, division, and the extraction of roots are more complicated. If we had, for example, to multiply $7\ 26'\ 43''\ 51'''$ by $11\ 47'\ 18''\ 56'''$, each term of one factor must be multiplied by every term of the other, and the denomination of each product must be as high as those of both factors put together. Thus when we come to $43'' \times 56'''$, the result must be in fifths $(2 + 3 = 5)$; and 43×56 being 2408, we have 2408^{v}, or $40^{\text{iv}}\ 8^{\text{v}}$. This process was aided by a large sexagesimal multiplication table, which may be seen in Delambre, *Astronomie Ancienne*, vol. ii., p. 32. There is also a large sexcentenary table, constructed by John Bernoulli (III.), and published (or republished) by the British Board of Longitude. There is little need to give any further account of sexagesimal processes.

SEXES OF PLANTS. The existence of sexes in the vegetable kingdom is now generally admitted by all botanists, but it is only lately that it has been adopted in its full extent. By the word sex is represented a collective idea of two individuals, the one producing fruit and the other being essential to the production of fruit in the first. This distinction of sex is much more marked in the animal than in the vegetable kingdom, and whilst in the former it has been recognised at all times, in the latter it has been the result of accumulated observation and experiment.

The question as to whether the antients were aware of the sexuality of plants, has been one of great difference amongst botanists, and much learning has been brought to the discussion. De Candolle, in his 'Physiologie Végétale,' tome ii., has quoted many passages from Theophrastus, Pliny, and some of the Roman poets, which furnish evidence of their having distinguished male and female plants. Herodotus (i. 193) also mentions the fact that in his time the Babylonians 'applied the fruit (he probably means the flowers) of the male palms, as the Greeks call them, to the fruit-bearing palms.' This operation he supposed to be of the same nature as that called caprification, which is practised on the fig. This consists in procuring the branches of the wild fig, and holding them over the fruit of the cultivated fig, which afterwards arrives quickly at maturity. These two processes however are essentially different, and proves that Herodotus had no clear idea of what he described. The first is a real instance of vegetable impregnation, as the wild branches of the date bear the male flowers, whilst the cultivated trees bear only female flowers. In the last instance the cause of maturing the fruit arises from the fact that the cultivated fig will not produce its fruit in perfection unless punctured by a little insect called a *cynips*, which abounds upon the wild fig, and the bringing their branches together communicates the insect from the one to the other. Whatever may have been the suspicions excited in the minds of Herodotus and other antient writers from these facts, it is very clear that no attempt was made to identify the processes of fertilization in plants and animals, and to regard it equally in each as the result of a union of sexes. Amongst modern writers Cæsalpinus and Zaluziansky seem to have been among the earliest to point out the fact that plants with female flowers did not bear fruit unless brought into contact with plants bearing male flowers. Clusius states, in a work published as early as 1611, that the female flowers of Carica Papaya produced no fruit without the male flowers. Subsequently to these observers, Sir Thomas Millington, Grew, and Kay stated in a very distinct manner, in their writings, the functions of the stamens and pistils. Camera however, a physician at Nürnburg, was the first who wrote expressly on the existence of sexes in plants, and drew the especial attention of botanists to the fact. But whatever might be the interest attached to this subject by previous botanists, it was not till the time of the great Linnæus, who made the sexes of plants the foundation of his celebrated artificial system, that their existence and importance were generally admitted by scientific men. It has been usual to give Linnæus the honour of the discovery of the existence of sexes in plants, but in his own works he has given the credit to whom it was due, and his great reputation would gain little by ascribing to him this honour, which so clearly belongs to others.

Although the doctrine of the sexuality of plants was generally admitted after this time, it has yet had occasional opponents to the present day, but the arguments brought against it are too weak to need serious refutation.

We shall enumerate here a few of the facts occurring in the vegetable kingdom on which this doctrine rests. It has been mentioned already that one kind of date-tree requires the presence of another in order to produce fruit. If we examine the flowers of the two trees, we shall find that one kind possesses pistils, and that the other possesses stamens, and it is not till the latter come in contact with the former that seeds are formed and the fruit comes to perfection. This was remarkably exemplified in the year 1800, in Lower Egypt, when the Mussulmans, being at war with the French, were unable to go into the woods to obtain the wild stamen-bearing flowers, and the consequence was a total failure that year of the date crop. The same thing occurs with all plants which have their pistils on one plant and their stamens on another. There is at present a specimen of the Chinese pitcher-plant (*Nepenthes distillatoria*) in the Edinburg Botanic Garden, with pistilliferous flowers, which never produced any seed or fruit till its pistils were brought into contact with the stamens of a specimen that was growing in another part of Scotland. Monœcious plants, or those which have their stamens and pistils on different flowers in the same plant, exemplify the same thing. If we take a cucumber plant, which is monœcious, and cut away early in their growth the stamen-bearing flowers, the pistil-bearing flowers will produce no fruit.

The stamens and the pistils, that are placed in different flowers in the date and the cucumber, are placed together in the same flower in many plants, which are thence called hermaphrodite. If we take the flower of one of these plants, say an apple-blossom, and cut out of it the stamens, it will be found that the pistil, instead of increasing in size and becoming an apple, will die away. Another proof is seen in what are called double flowers. In these flowers, which are very common amongst the cultivated species of plants, the petals are increased in number and size at the expense of the stamens: the stamens in fact being metamorphosed into petals. In these flowers the same thing occurs as if the stamens had been cut away; the pistil is not fertilised, and neither seeds nor fruit are the result of their growth.

By the production of what are called hybrids among plants, the fact of the existence of sexes is still more satisfactorily proved. It is well knewn that if two animals of different species breed together, the produce is a third, which is like neither parent. And this is the case with plants. If tho stamens of one species be applied to the pistil of another at the proper period, the seed produced on the ripening of the pistil will produce a plant with the characters of the two parent plants mixed. This property of producing hybrids is much more common among plants than animals, and frequently occurs in the wild state. It will not however occur between all species, but only such as are very nearly allied; and is seldom known to take place at all between different genera.

The movements of the stamens and pistils at the period of impregnation are also proofs of the necessity of contact between these two organs. In many liliaceous plants, in some of the saxifrages, and in the parnassia, the stamens, which are placed almost at right angles with tho pistil in the first stage of their growth, rise up and place themselves in immediate contact with the pistil. In the geraniums and the kalmias the filaments curve down, in order to bring the summit of the stamen, the anther, into connection with the pistil. In some cases the summit of the pistil, the stigma, which is the part on which the influence of the stamen is exerted [Impregnation], is carried towards the stamen, as in the passion-flowers, the nigella, and tho epilobiums. In other instances the stigma dilates in a remarkable manner, as in the tulips and the gratiola. The relative position also of the stamens and pistils in hermaphrodite plants is such as to secure tho influence of tho stamen on the pistil. In those cases in which the stamens are longer than the pistil, the flower is always upright; so that the pollen, which is the fertilising agent of tho stamon [Pollen], falls directly upon the stigma. On the contrary, when the styles of the pistil are longer than the stamens, the flowers droop; so that the pollen, when it is discharged, is effectually carried to the stigma. This is seen in the Campanulas and Fuchsia. Many other plants exhibit arrangements of this nature for the accomplishment of the same purpose.

Another curious set of arrangements for effecting of the fertilization ef plants are those which secure the application of tho pollen to the stigma in a perfect state. If the grains of pollon are exposed to water or too much moisture, they burst, and their fecundating power is lost. This is the reason why heavy rains do so much injury to crops in blossom, as they break the anther-case; and tho pollen being exposed to the action of water, it cannot fertilise the pistil, and no fruit is produced. In some plants there is no protection against this cause of sterility; but in others, as is well known, the flowers close previous to rain, and thus the effect of moisture is prevented. In aquatic plants, there are several means for protecting tho pollen from the influence of the water. In the Zostera, which grows at the bottom of the sea, the flowering takes place in a doubling of the leaf, which contains a certain quantity of secreted air, and the influence of the water is thus kept off. In many plants that grew at the bottoms of lakes and rivers, the flower-stems are always elevated above tho surface of the water; and no fertilization of the pistil takes place unless the flowers reach the air. This is the case in tho white and yellow water-lily, in the Myriophyllum, Hippuris, &c. The Utricularia possesses a complicated apparatus. It remains for the most part of the year at the bottoms of ditches and ponds; but at the season of flowering it ascends to tho surface, and, after fertilization is accomplished, descends again. This is effected by its leaves and stem being supplied with a number of small vesicles, which, when the plant is at tho bottom of the water, are filled with mucus, which by its weight keeps tho plant in its position; but as the season of flowering approaches, theso vesicles become filled with air: the plant being thus rendered specifically lighter than the water, it is torn up by its roots, and floats to tho top. When fertilization is effected, the vesicles again fill with mucus; and the plant sinks to the bottom, and matures its seeds in a situation fitted for their future germination.

With all this evidence, proving the necessity for two sets of organs for the reproduction of the species of plants, it will not be necessary to enter into the objections that have been raised against the doctrine of the sexuality of plants. These objections have been generally founded upon the occasional observation of the fact that seeds and fruit have been produced where stamens could not have been present; but it might as well be urged against the same theory in animals, that in some species, as the aphis, reproduction takes place without the concurrence of two individuals. A question however of some interest has been recently raised by some eminent German botanists as to the correctness of calling the stamens the male and the pistils the female organs. Schleiden, who has paid great attention to the microscopic investigation of vegetable tissues, maintains that the pollen grain is the true ovulum, 'if the ovulum,' he says (Lindley's *Introduction to Botany*, p. 346), 'be understood in physiology to represent that material foundation from which the new being becomos immediately developed, and if we term that portion of the organism in which this material commencement is deposited beforo it becomes developed, the female organ; whilst that part which calls into action or promotes the development of the germ by means of its potential effects, is termed the male organ, it is evident that tho anther of the plant is nothing but a female ovarium, and each grain of pollen the germ of a new individual. On the other hand, the embryo-sac only works potentially, determining the organization and development of the material foundation, and for this reason therefore ought to be termed a male principle, were we not to consider, perhaps more correctly (without embarrassing ourselves with lame analogies taken from the animal kingdom), that tho embryo-sac morely conveys new organizable fluids by means of transudation, and thus only serves the office of nourishment.' Endlicher and some other botanists maintain similar views.

The possession of sexes by Cryptogamic plants is at present only matter of inference. The existence ef femalo organs in most of the orders seems tolerably clearly made out; but various parts havo had the function of the male organ assigned to them. Much light may be expected to be thrown on this department of botany by further inquiry.

The structure of the organs of the sexes is explained under the articles Anther, Pollen, Stamen, Stigma, Sporule, Sporangium, and Theca.

SEXTANS (the Sextant), a constellation which Hevelius had the singular bad taste to place on the back of the Hydra and at the feet of the Lion. It comes directly between the bright stars *α* Leonis (Regulus), and *α* (or Cor) Hydræ.

Character.	No in Catalogue of		Magnitude.	Character.	No. in Catalogue of		Magnitude.
	Flamsteed. Piazzi. ( ) Bradley. [ ]	Astron. Society.			Flamsteed. Piazzi. ( ) Bradley. [ ]	Astron. Society.	
b	2	1168	5	*i*	26	1239	6
s	4	1183	6		27	1241	6
t	6	1185	6	*k*	28*	1246	5
A	7	1189	6	*l*	30	1248	6
d	8	1190	6	*u*	31	1250	6
	9	1191	6	*x*	32	1253	6
	10	1192	6	*m*	33	1267	6
	11	1194	5½		34	1270	6
e	13	1201	6		35	1272	6
C	14	1205	6	*n*	36	1275	6
f	15	1208	4	o^1	37	1277	6
	16	1210	6	o^2	38	1280	6
g^1	17	1211	6	*p*	40	1286	6
g^2	18	1213	6	*r*	41	1288	6
	19	1216	6		(6)	1215	6
	21	1218	6		(223)	1195	6½
z	22	1224	6	*q*	[1456]	1245	6
h	23	1231	6				

SEXTANT. The history of the sextant was involved in some doubt until the late Professor Rigaud undertook to investigate the subject. The result will be found in the 'Nautical Magazine,' vol. i., p. 351, and No. xxi. The following account is a brief outline of his inquiry.

The early modern navigators used the *cross-staff;* this was afterwards exchanged for Davis's *back-staff*, called by the French *quartier anglais*. Hooke proposed an instrument for the purpose of taking altitudes at sea, which is very ingenious; the sun was seen reflected from a plane glass, while the horizon was viewed directly.* Hooke does not seem to have esteemed his invention so highly as it deserved, for in a subsequent lecture on astronomy and navigation, in 1694, he makes no mention of this, but describes a quadrant of a different construction. In 1699 Newton exhibited an instrument to the Royal Society, which is described as 'the old instrument mended of some faults;' and at some later time he communicated to Dr. Halley a scheme for an instrument which was probably never executed, but of which a drawing and description were found among Dr. Halley's papers after his death in 1742. (*Phil. Trans.*, vol. 42, p. 155.)

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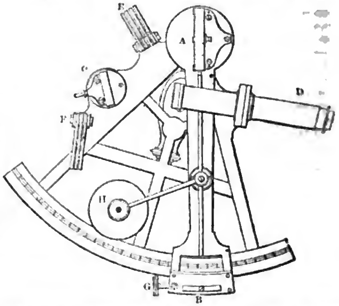
* This star is supposed to be a mistake of Flamsteed's, and to be only another version of 29 Sextantis. (Baily's 'Flamsteed.')

The date of the invention of Hadley's quadrant was proved, on examination by the Royal Society, to have been not later than the summer of 1730. A notice of it was given at a meeting of the Society, May 13, 1731; and the instrument exhibited May 27. The memoir is published, vol. 37, p. 147.

At the meeting of the Society, May 20, Dr. Halley expressed an opinion that the principle of Hadley's new instrument had been discovered and proposed by Newton, and a search was made into the minutes of the Society to ascertain the fact. The only notice which could be found was that already mentioned, viz. in 1699, and this was clearly an improvement of an old instrument, and not the proposal of one new in principle. Halley, at a meeting on the 16th of the following December, expressed himself satisfied that Hadley's instrument was much different from that formerly invented by Sir Isaac Newton. It seems not unlikely that Halley's recollections were of the instrument which Newton had proposed to him, and the description of which was found among his papers, but that he had forgotten the manner of the communication, and confounded the latter instrument with that which Newton had exhibited to the Royal Society. This is, we think, a very probable failure in the memory of a man of seventy-six, and what many younger persons experience daily. That Halley did not immediately see the advantages of Newton's latter proposal may appear a little strange, but Halley's forte clearly did not lie in mechanical construction or astronomical observation.

A little after Hadley's invention, viz. about October or November, 1730, Thomas Godfrey of Philadelphia, a glazier by trade, proposed and had executed an instrument which he called a bow, very much resembling Hadley's earlier construction. This was described in a letter to Dr. Halley from James Logan, Esq., dated 25th May, 1732. Mr. Logan had put off writing more than twelve months after the instrument was placed in his hands, and this neglect threw some doubt on the originality of the invention, which could only be satisfactorily established by additional evidence. After examination the Royal Society came to the conclusion that Godfrey's discovery was also original. We think it is clearly proved that the priority is due to Hadley, and that there is no pretence for doubting Godfrey's originality. Some hasty writers, adopting mere hearsay for their guide, have attempted to give the subject a national and *patriotic* colour, which, unphilosophical at all times, is a simple absurdity when the contending parties are, as in this instance, of the same race. We have thus tried to give a hasty summary of Professor Rigaud's statements and conclusions, which we entirely adopt. The perusal of the original memoirs will gratify the lover of exact and discriminating research. Hadley's second construction, which is incomparably superior to his first and to Godfrey's bow, scarcely differs from the present sextant.

The sextant is figured and described in almost every book of navigation, and is so commonly to be met with, that we shall be very brief. A is a plane glass, called the *index* glass, silvered behind, and perpendicular to the face of the instrument. It is fixed on a centre perpendicular to the instrument, and moves with the *index bar* AB, the end of which, B, slides over the graduated arc. C is a plane glass, the lower half of which, next the instrument, is silvered, and the upper half left clear. It is called the *horizon*-glass, and should be parallel to the index-glass when the index points to 0° at the beginning of the arc. D is a telescope for viewing the objects observed. This should be of good quality and with an inverting eye-piece. In the common quadrants there is merely a plate with a small hole for directing the sight. Suppose a ray of light to proceed from the eye, it will proceed in the direction of the telescope, and if it falls on the upper or unsilvered part of the horizon-glass, it will pass forward in a continued straight line until it falls upon some exterior object. But if the ray falls upon the silvered part of the horizon-glass, it will be reflected to the index-glass (the horizon-glass is so placed as to make equal angles with lines from the eye and index-glass), and again reflected from the index-glass, outwards (*i.e.* from the observer), until it meets some external object. Now instead of supposing the rays to pass from the eye, suppose them to come from external objects to the eye; then there will be two images presented at the same time, one formed by the rays which pass through the unsilvered part of the horizon-glass, and another formed by the rays which have been previously reflected by the two glasses; and it is easily shown from the elementary principles of optics, that when two objects are thus apparently seen in coincidence, the angle which they subtend at the point of meeting is exactly double the angle which is contained between the planes of the index and horizon glasses, if these be supposed to be prolonged until they meet. Hence, if the index be at zero when the glasses are parallel, and if the arc be divided into half-degrees which are numbered and subdivided as whole degrees, the arc actually read off, after any such observation as is here described, will measure twice the inclination between the glasses (for this inclination is evidently the same as the angle between the parallel position of the index-glass and its new position), and, in consequence of the optical principle above mentioned, this will be the true measure of the angle between the objects when they are so distant that the place of the eye and the intersection of the rays may be considered to be the same. The sextant therefore furnishes the means of measuring the angle between any two well-defined objects, in whatever direction they may be placed (so that the angle does not exceed 140°), and without requiring more steadiness than is necessary for seeing the objects distinctly. E and F are sets of dark glasses of varying intensity, which may be turned before either the index or horizon glass when required; G, a tangent screw for giving slow motion to the index-bar; H, the reading microscope and reflector. The handle below is visible in the drawing, and there is a screw behind the collar of the telescope for giving an up-and-down motion to the telescope, which alters its distance from the plane of the instrument without affecting its parallelism thereto.



The adjustments of the sextant may be divided into those which more properly concern the artist and those which are to be attended to by the observer. It should be distinctly understood that no other instrument requires so much care and skill in its construction and use as the sextant. There are scarcely half a dozen makers in England, and probably not double that number in all Europe, who are fit to turn out a sextant; and though skilful sextant observers are somewhat more plentiful, they are still exceedingly rare. The fabric of the sextant should be strong and light. A blow which would not seriously damage a theodolet or circle, where three or more readings correct pretty nearly the errors which arise from such injury, would entirely ruin a sextant; but while giving strength, the maker must be on his guard to avoid weight. Troughton and Simms's double-frame sextants of 8 inches radius are a very good model, those of 10 inches are too large; single-frame sextants may be had of 7, 6, or 5 inches radius. All these sizes have or may have the same telescope, glasses, and shades. Those which we have hitherto seen seem to admit of some improvement in their scheme. Mr. Dollond casts his sextants in one piece of hard metal, which is an improvement, and very beautiful instruments they are. The limb of the instrument should be perfectly plane, and the axis on which the index-glass turns exactly perpendicular to it. If a purchaser is sufficiently confident in his own judgment to rely on that, rather than on the reputation of the maker, he should release the clamp, observe whether the index-bar moves easily and without shake along the whole arc, and also whether the vernier seems to press equally in every position. The telescope should be of the best quality, with a large aperture and of as short a focal length as these conditions permit. It should show the edge of the sun and moon quite sharp and distinct with the highest powers employed. The index-glass is generally the most faulty member of a common sextant; the faces are not parallel, and consequently when rays fall very obliquely upon it (in which case those reflected from the front surface are nearly as copious as those from the silvered back), there are two faint and separated images seen instead of one bright one. The artist tries his index-glasses by the following test: The sun is viewed with a high power after *very* oblique reflection from the index-glass, and those glasses only are retained in which the image is single and sharp. The rejected glasses find their way to the second-rate makers. The horizon-glass, which is smaller and on which the rays fall at a larger angle, does not, if imperfect, affect the images so much, but it too should be examined. The shades or dark glasses, which are either interposed between the glasses or placed before the horizon-glass, are next to be examined. The two images of the sun are brought into proper contact, after applying the highest power to the telescope and putting the proper dark glass on the eye end. One of the lightest shades is then interposed between the index and horizon glasses, and if the contact is slightly disturbed, this shows the form of the shade to be prismatic. The shade is turned in its cell until the effect is perpendicular to the plane of the sextant. The corresponding shade before the horizon-glass is now interposed and tried as the former one, and turned round exactly as before, until its effect is also perpendicular to the plane of the instrument. Leaving this latter shade untouched, and substituting the next dark shade in place of that first employed, the process is again repeated, with this caution, that the error, if any, caused by the prismatic form of the last shade, is to be made exactly contrary to that of the first shade, as well as perpendicular to the plane of the sextant. In this way, changing when necessary the dark glass at the eye end of the telescope, all the dark shades are carefully examined and set right, and it need not be said that those which are very prismatic or which affect the sharpness of the images are to be rejected. The index-glass is now to be set at right angles to the plane of the instrument. This is done by looking very obliquely in the index-glass, when the edge of the limb or the divided arc seen by reflection will form an uninterrupted continuation to that seen directly, if the glass is perpendicular; otherwise the arc will appear broken where the direct and reflected images meet; by touching the screws seen in the figure, this error may be corrected. Repeating the observation at different parts of the limb, will show whether the axis has been set at right angles to the limb. The horizon-glass is to be made parallel to the index-glass by bringing the two images of the sun to coincide, when, if there is any lateral overlapping, it may be remedied by turning a screw (shown in the figure) which is in the mounting of the horizon-glass. The index error, as it is called, is of no importance whatever, though many observers are afraid that when large it vitiates the observation. This is an idle prejudice, but one which the maker is compelled to respect. Having ascertained the diameter of the sun by measuring it forwards and backwards, he sets the index to the proper angle and then files away a little of one of the pins against which the index-glass is pressed, until he brings the images nearly into contact. Contacts should now be formed, first by turning the tangent-screw so as to separate the images, and then by bringing them together. If the readings do not agree, the centre moves too stiffly or the index-bar is too weak. Finally, the telescope is to be set parallel with the plane of the instrument. There are two parallel wires in the focus of the telescope, which are to be placed parallel to the instrument, and then as large an angle as possible is to be taken between two distinct objects, making the contact exactly in the middle of the wires. The contact must now be examined when the objects are first at one side and then at the other of the field of view. If they separate equally when at equal distances from the centre, the position of the telescope is correct; if not, there are adjusting screws in the collar which carries the telescope by which this error may be corrected. For some of these latter adjustments mechanical means may be and sometimes are applied. The instrument should however comply with the foregoing tests, which any one can try who understands the use of the instrument.

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* This is described in Hooke's 'Posthumous Works,' p. 503, and was probably presented to the Royal Society in 1666. In practice, besides some other objections, it would have been troublesome to ascertain the *index error* in this construction.

We will now suppose an observer equipped with such a sextant, who wishes to make the best use of it. Before taking a series of observations, the index error should be ascertained. The telescope is fixed and set to focus, and the parallel wires placed parallel with the plane of the instrument. If the sun is visible, a dark glass for the eye-end of the telescope is selected, which shows him clearly, but without distressing the eye, and the direct and reflected images are made equally bright by moving the adjusting screw, which raises or depresses the telescope. The contact is first made, bringing the reflected image apparently below the image seen directly, and the angle is read off on the supplemental or back arc: suppose this reading to be $33'$, which consider positive or +. Then make the contact again with the reflected image apparently above that seen directly (the reflected image is that which moves on moving the index), and read off again: suppose this is $32'$, which call −. It is evident that at the middle position the two images coincide, and the index and horizon-glass are parallel; that is, the reading on the back arc is $30''$ when the glasses are parallel. Hence $30''$ must be *added* to every other reading to give the true angle. If the algebraical signs are used, the rule is very simple: Add the two readings together and halve the result; this with its *proper* sign is the *index correction* to be applied to all observations. If the sun is not visible, the moon may be used in the same way. If neither is to be seen, then bring the two images of a bright star, or the sea horizon, or any *distant* well-defined object into contact, and the reading, if on the back arc, is to be added, if on the forward arc, is to be subtracted from all other observations. The sun is always to be preferred when visible, and the observation is to be repeated before or after observation. If the images overlap laterally, *i.e.* if the horizon-glass is not parallel to the index-glass, this must be previously adjusted. The next caution is with respect to dark glasses. When it is possible (as in observing altitudes of the sun at land in a mercurial horizon, &c.) to make the observation with a single dark glass on the eye-end of the telescope, without using any shade, this should always be done, for the error of this dark glass does not affect the contact at all, and the distortion caused by it is not magnified, whereas any fault in the dark shade between the index and horizon glasses produces actual error in the observation, and the distortion is magnified subsequently by the telescope. The images are to be brought to equal brightness by the screw which raises or depresses the collar carrying the telescope, and that with considerable nicety. In observing distances of the sun and moon, or altitudes of the sun at sea, dark shades are necessary. The fainter object is to be observed directly, and a proper shade interposed between the index and horizon glasses to reduce the two objects to something like the same brightness. The final equalization is to be effected by the up-and-down motion of the telescope. The accuracy of the observation depends a good deal upon the nicety with which this equal toning of the two images is effected; with a little experience this is readily learned. From the construction of the sextant the faint object is easily viewed *directly* when the brighter object is either above or on the right hand of the fainter, but not so if the bright object is to the left of the fainter, when the handle side of the instrument is uppermost. For these observations, the instrument should have a second handle, which may be applied when wanted; perhaps when the distance between the moon and a bright star or planet is to be observed, there may be no difficulty in viewing the moon directly, after placing a dark shade before the horizon-glass, though the light which enters the eye without passing through the telescope must deaden the retina considerably. A blackened card screen slipped over the tube of the telescope would probably be found useful in this case, and absolutely necessary if the sun were observed directly. This latter observation cannot, we conceive, be satisfactorily made in any case. When the sextant is held in the hand, it should not be grasped tightly, as this causes tremor. The handle should be fitted to the observer's hand. There is scarcely ever hold enough given. When observing an altitude at sea, there is a little difficulty in bringing down the object to the point of the horizon immediately under it. But as the shortest distance is the true distance, by running along the horizon and keeping the object in the field, the direction in which the object should be observed is easily found, and the contact made there. In observing lunar distances the great art is to turn the instrument round the line of sight exactly as if the telescope were an axis of rotation. The index is set to the approximate distance, and the fainter object viewed directly; when the plane of the instrument passes through both objects, the brighter will come into the field, and the contact is to be made by the tangent-screw, or nearly so. We think it is better in all cases where the angle between the objects is increasing or decreasing, to make the contact open or close, and then try to seize on the moment when the contact is perfect, or the two moments when the contact begins and when you conceive it to end. The mean will probably be near the truth. All contacts must be made scrupulously in the centre between the two parallel wires. When the angle is large, inattention to this point will cause considerable error.

On shipboard, the observations, except those of lunar distance, are necessarily rude and imperfect, the sea horizon is generally ill defined and badly seen, the dip is somewhat uncertain, and as the single altitude is observed, all the error committed tells upon the final angle. The accuracy of observation is however equal to the wants of navigation in ordinary circumstances. (A *dip sector* might be useful where more than usual accuracy is required.) On land, where the altitudes are taken from a mercurial horizon, and the sextant fixed on a stand, the observation is capable of great accuracy, and does not require much skill or delicacy in mere handling. There is one peculiar advantage in sextant observations, that when the mercury is quiet enough to reflect a well-defined image, there is no need of any further steadiness or of a second observer, one of which conditions is absolutely necessary in every other instrument in common use which is adjusted by a plumb-line or level. We think the capabilities of the sextant as a geographical instrument have not been generally appreciated by English travellers; certain it is that few have used it with all the profit they might have done.

The mercurial horizon is a shallow rectangular wooden or iron trough, into which a small quantity of mercury is poured. If there is any wind, the trough must be covered with a penthouse, the sloping sides of which are glazed with plates of glass ground very flat and true. Any object seen in the mercury appears to be just as much below the horizontal plane as it is really above it; hence if the angle between any heavenly body and its reflection be measured, this angle is just twice the actual altitude of the body at that time above the horizon of the place. Suppose the altitude of the sun is to be observed in order to determine the time: The trough is placed with its largest dimension towards the sun, and the roof so that the sides cast no shadow, the proper dark glass is affixed to the telescope, the images brought to equal brightness, the index error ascertained, and the telescope is then directed to the image of the sun in the mercury. Holding the plane of the sextant vertical, and moving the index forward gradually, the image of the sun reflected by the index-glass will appear to enter the field from below. If the sun be rising, the index should be carried forward until the two images, having crossed, are clear of each other, and then the index is clamped. The two images will gradually close, and the exact moment by the chronometer is to be noted when the contact takes place. If the sun is rising with tolerable rapidity, the contact of the upper limb, *i.e.* the separation of the two images, should be noted, exactly as before, without touching the clamp. The index is then read off; it may then be put forwards, and the observation repeated. If the interval between the contacts of the lower and upper limb is found to be in both cases nearly the same, the observer may be satisfied that he has committed no great error in noting the moments of contact. Where the greatest accuracy is required, it is usual to set the index to a whole number of degrees for the first pair of observations, and to put it forward 1° 30′ or 2° for the second pair, and so on till the observer is satisfied or wearied; and then in the afternoon to set to the highest reading for the first pair, and so on *backwards* till you arrive at the first reading. Collecting the corresponding pairs, you have an approximate time for apparent noon, which, after being corrected by the *equation to equal altitudes* for the change of the sun's declination, gives the time of *apparent* noon by the chronometer; and this, when corrected a second time by the *equation of time* taken and interpolated from the 'Nautical Almanac,' gives the time of *mean noon* by the chronometer, and consequently the error of the chronometer on mean time at the place. If the altitudes are very low, and the barometer and thermometer have changed considerably between the observations, a corresponding correction must be applied, but in most cases this is not requisite. The time may in this way be generally got as accurately as the chronometer will keep it during the interval. When observations of the sun are made for the latitude, the altitudes should be taken continuously for several minutes before and after apparent noon, observing the upper and lower limb alternately, or at least an equal number of each: thus getting rid of the sun's semidiameter, besides bringing more divisions into play. It is not easy to give a definite rule for the extent of these observations on each side noon; but when the time is known, and the altitude of the sun not great, we have never scrupled to go as far as the *Tables of Reduction*, *i.e.* a good half hour on each side the meridian. It is of great importance however, when the observations are pushed so far, that the number of observations on each side, and the times at which they are taken, should nearly correspond. If this precaution be observed, a slight error in the actual time of noon does not matter. When time is determined by absolute altitudes, the roof of the mercurial horizon should be reversed after half the observations, and the same precaution should be adopted when observations are made for the latitude. For equal altitudes it is necessary to keep the same position of the roof in both cases.

In the observations already described, and for lunar distances, a stand for the sextant will indeed add greatly to the accuracy of the observations, but is not absolutely necessary for a practised observer; so far as our own experience has gone, good observations of the stars can scarcely be made without a stand. By lying on the ground, and resting the edge of the sextant on a book or some convenient support, the observation may undoubtedly be made; but in most situations and in many climates this would expose the observer to more inconvenience and risk than he can prudently encounter. With a stand, and a little experience in setting it up, the observation of a star is just as accurate as that of the sun. The time is noted when the images form a figure like this **, parallel to the horizon; and stars of the third magnitude, or even lower, are quite bright enough for the purpose. We have observed Polaris very tolerably with a snuff-box sextant when the instrument rested on a book; the telescope, though of extra size for the instrument, was of much smaller aperture than those attached to ordinary sextants. It is rather steadiness which is required for these observations than light. Equal altitudes of the same star give the moment of its meridian passage by the chronometer without computation; and as this is the R.A. of the star, the error of the chronometer, if it be sidereal, is obtained at once; if it should be a solar chronometer, the computation is very easy, *i.e.* merely computing the mean solar time of the star's transit of that day from the R.A. of the star and the longitude of the place. The computation of *circummeridian* altitudes of a star for the latitude is rendered more simple by using a sidereal chronometer, for the hour angles observed with the solar chronometer must be reduced to sidereal time before taking out the corrections to the meridian from the Tables of Reduction.

There are certain faults either usual or inevitable in the sextant, which are now to be pointed out, and the mode of eliminating their effect from the final result. First, the determination of index correction is always somewhat erroneous, and this error runs through all the absolute observations, and affects the mean with its whole amount. Again, if the telescope be not parallel to the plane of the instrument, or if the contact be not made exactly midway between the wires, the angle read off is too large, and exceeds the true angle, and there is no principle of compensation; this class of errors has always the same sign. Finally, as sextants are now divided, there is no certainty that the axis of the index is exactly concentric with the divided arc. It is difficult to say within what limits this error is confined, but we think it amounts not unfrequently to 10″, 15″, or even 20″ in the total arc.[*] This is not however proportional to the arc, though it is generally smaller in the smaller arcs. Hence if this effect of excentricity lie the same way as the other errors, as it easily may, the most careful observer will make a considerable mistake in measuring a large angle. If we further suppose the error of the lunar tables to be in the same direction (the best meridian observations show that she is not unfrequently from 10″ to 15″ out of her tabular place), it will be seen that the longitude, determined as it generally is by distances between the moon and sun, or the moon and a *single* star, may differ much more from the truth than lunar observers usually think possible.[†]

Mere instrumental error is got rid of by combining those observations which they affect in contrary ways. Thus in equal altitudes, the *fixed* errors, such as index error, excentricity, bad division, inclination of the glasses or telescope, have contrary effects on the morning and afternoon sights, and therefore no effect on the mean. Making the contacts out of the middle of the wires is a casual error, and just as likely to happen in the morning as in the evening observations; so that as the angles are the same in both cases, errors of this kind will have pretty much the same influence on the mean of several pairs. Hence the great excellence of the method of equal altitudes for determining the time, so far as instrumental error is concerned; it is an additional advantage that an error in the supposed latitude is also without sensible influence. Again, if time is deduced by absolute altitudes of a star rising in the east, the result will be affected one way by the errors above described; if a second star be observed at nearly the same altitude setting in the west, the altitude will be affected to the same amount; and if the stars have declinations which do not widely differ, the result deduced from the second star will be affected to the same extent, but in a contrary way from the first; a mean of the two results will be nearly free from any error, except the casual error of observation. A latitude by the sun or a star to the south, which is erroneous from the above-mentioned causes, will be balanced and corrected by a star of nearly the same altitude to the north; or a star to the north may be balanced by two to the south, one of higher and the other of lower altitude. It is scarcely credible how nearly the time or latitude may be thus determined. We have a series of such latitudes with an 8-inch sextant, observed by Mr. Lassell at Liverpool, which scarcely differ more than 2″ or 3″ from each other, though deduced from different groups of Greenwich stars. When the longitude is to be obtained from lunar distances, a considerable number of observations should be taken from the objects east and those west of the moon. If a pair can be selected on different sides of the moon, and nearly at the same distance from her, the result will be liable to the effect of casual error only, and to the error of the lunar tables. This latter error cannot be got rid of at the time of observation: but after the Greenwich, Cambridge, Edinburgh, Cape of Good Hope, and Oxford observations for the year have been published, it will generally be possible to find the error of the moon at the time of observation with considerable accuracy. This must be done whenever a sure longitude is to be deduced from lunar distances, and lunar observations must be taken in great numbers, so as to destroy casual error, to settle nice points in geography.

When a few more fundamental points in longitude are fixed, it will not be necessary to use lunar distances, except in long voyages, or in the centre of large and uncivilized countries. The recent improvements in chronometers, and the reduction in their price, have greatly superseded this kind of observation already, and will continue to do so more and more.

When the arc of the instrument is limited to 90°, which is usually the case in the common wooden instrument, it is called a quadrant (and sometimes an octant, as being in form an eighth of a circle), and a second horizon-glass and sight are sometimes appended for the *back* observation. A sight-vane (a plate of brass pierced with a small hole) is placed below the ordinary horizon-glass, and a second horizon-glass is fixed near this vane, so that lines from the centre of the index-glass, and from the latter vane, make equal angles with its plane. The plane of this second horizon-glass should be at right angles with the index-glass, when the index is at zero. This adjustment may be verified by making the sea horizon, seen directly through the second vane and unsilvered part of the second horizon-glass, coincide with the sea-horizon at the back of the observer, which is seen by two reflections from the index-glass and silvered part of the second horizon-glass. The angle between the fore and back sea-horizons is evidently equal to $180° +$ twice the dip of the horizon. The dip is known from the observer's height above the sea-level. Suppose it to be 4′, and that the reading on the back arc is 5′; it should be twice the dip, or 8′: therefore the zero position of the index for the back observation is at 3′ on the forward arc. This may be corrected by altering the second horizon-glass, if there are the means of adjustment, *i.e.* by making the front and back sea-horizon coincide when the reading is 8′ on the back arc. By moving the index forward, the reflected sun, which is behind the observer, can be brought to touch the sea horizon in front; and the reading, when the index error has been corrected, is $180° -$ the sun's distance from the front horizon. Now this latter angle is evidently $180° + 2 \times$ dip $-$ sun's altitude; hence it is clear the angle read off is the sun's altitude above the horizon $- 2 \times$ dip. Hence sun's altitude $-$ dip (the altitude required) $=$ angle read off $+$ dip. If the index error be not adjusted, the angle must be corrected for the index error; in the preceding instance the 3′ must be added to the sun's altitude. The back observation however, though useful in certain circumstances, is not much used at present, and many quadrants are fitted up without the second vane and horizon-glass.

If a sextant be used in the manner we have attempted to describe, the results will be found to be very satisfactory. The attentive reader will see that the principle to be seized upon is that of always making two observations at nearly the same time, in which the errors, except the casual errors of making the contacts and of reading off, are the same, but the effects of which on the final result are different. It is not always convenient to afford the time which these balanced observations require; and, in fact, they are often impracticable. It will therefore be well worth the careful observer's while to determine the constant errors of his sextant, at different angles, where he has a good opportunity, and to use this knowledge where circumstances do not allow him to make a balanced set.

Very small sextants are sometimes fitted in a box, and are called *snuff box* sextants. These admit of considerable accuracy, but, except in particular cases, they are not carefully adjusted, &c. The principle is of course the same as in the larger sextants, and they have a small telescope and dark glasses. It is desirable that the box should be wide enough to admit a finger to wipe the glasses, especially when the snuff-box sextant is used, as it frequently is, for maritime surveying. The salt spray very soon clouds the glasses, and there is no light to spare. For all sea-going purposes, except taking lunar distances, and for military and maritime surveying, the snuff-box sextant will be found very convenient and sufficiently accurate. If made with the utmost care, and skilfully used, we think it capable of determining the latitude within 1′, and the time to 3^s or 4^s; but an instrument-maker could not be expected to take so much trouble, unless for a favourite customer or for an expedition of some importance.

After the invention of Borda's repeating reflecting circle, Troughton, who was averse to the principle, produced a non-repeating circle, which he called the British circle, but it more commonly goes by his name. This may be understood by conceiving the circle, of which the sextant is a part, to be completed, and that while the telescope and glasses are at the front of the instrument, the divisions and three equidistant verniers attached to the index-glass are at the back. The observations ought always to be made in pairs, and for this purpose there are two handles, one to the front and another at the back. Thus, suppose it were required to take the altitude of the sun: this is first observed exactly as with the sextant, and the three verniers read off, the index-glass being above the line which joins the telescope and horizon-glass. Let the instrument be conceived to turn round this line through 180°, then the index-glass is below, and with the face downwards. By moving the index backwards to zero, it will become parallel to the horizon-glass, and continuing this motion until it is at the original angle, but *on the back arc*, the sun will be brought down exactly as in the former observation; when the contact is to be made with the tangent screw, and the indices again read off. By combining the observations, it is clear the index error is destroyed, and this is one point of superiority to the sextant. Again, the three readings wholly destroy any effect of excentricity, and very greatly diminish those errors which may arise from accidental injury to the figure of the circle: while the six readings greatly reduce the errors of division. The errors caused by defects in the dark glasses and horizon-glass are eliminated, and such as arise from a defect in the index-glass are diminished, and this too by the principle of the instrument, using it independently upon one object. These advantages are undoubtedly very great, but the additional weight of the circle and trouble in handling it, the trouble of reading three verniers for every observation, the shortness of the radius, and consequent necessity of limiting the subdivision to 20″, seem to overbalance them in the opinion of most seamen. We think that an intelligent observer will get results of nearly equal value from the sextant or from Troughton's circle, but that the sextant requires much care in selecting and balancing observations, which the circle does not. Whenever time or latitude is to be deduced from observations of one object at one time, as where the sun alone is used on geographical expeditions, or when lunar distances are taken from the sun alone, or from one star, the sextant cannot enter into comparison with the circle. A very excellent Spanish observer, Don J. J. Ferrer, determined the obliquity of the ecliptic with one of Troughton's circles more accurately than the Greenwich quadrant could do, at a time when that quadrant was still the principal declination instrument in the Royal Observatory. And if frequent reading off is not too great an objection, Troughton's circle may be recommended as the safer and more independent instrument, and as demanding less thought and care from the observer.

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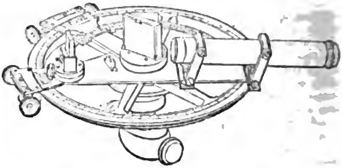
[*] Mr. Simms is of opinion that with a dividing engine of a better construction, this error of excentricity may be reduced to 2″ or 3″.

[†] We think no prudent seaman would rely upon lunar distances at sea to a smaller quantity than one third of a degree. At land a good observer should seldom be out more than an eighth of a degree; and a large mass of careful observations, corrected for the errors of the lunar tables, might perhaps come within the sixteenth or twentieth of a degree. This seems to us almost the limit of what is to be expected from lunar distances, and it is inferior in accuracy to one favourable lunar transit, with a tolerable telescope, a well practised observer, and a corresponding observation at a principal observatory.

We have already, in the article Repeating Circle, described the original discovery of the principle by Tobias Mayer and his first application of it. After Mayer had greatly improved the lunar tables, he proposed the following construction for measuring the angle between the moon and any other object with the greatest exactness. (*Tabulæ motuum Solis et Lunæ, auctore Tobias Mayer*, London, 1770.) The instrument is an entire circle, on the centre of which the index-bar turns, the index-glass being over the centre. The telescope and horizon-glass are fixed on a second bar, which also turns, but excentrically, on the same centre. The two bars can be clamped independently of each other, and each in any position, and there is an index or fiducial line to each, by which the divisions of the circle may be read off. Now, suppose a distance between the moon and sun to be required (the dark shades, &c. may be understood from what has been said on the sextant): First, having fixed the index-bar at zero, bring the horizon-glass to be parallel to it by observing the sun (as in determining index correction); then move forward the index-bar, and observe the distance between the moon and sun's nearest limbs, as with the sextant. If the angle were now read off, we should have the simple distance affected with the whole error of graduation, and obtain no advantage over the sextant. By moving the horizon-bar, bring the two glasses to be parallel exactly as before, and make the measure between the limbs of the moon and sun also as before, by moving the index-bar alone. The angle, if read off now, would be twice the angle required, but the errors of division and reading off would be only those which affect the first and last position of the index-bar. In this way the angle may be *repeated* as often as you please, until the bars have travelled once, twice, or even oftener round the circle, and it is evident that the errors of division and reading off are those at the first and last position of the index-bar, and those alone; which may be as inoperative on the measurement of the angle as the observer pleases or has patience for. This would seem a great advantage, but when Bird was ordered to make a circle on this model, the divisions were found to be so good, that repetition added little to the accuracy of which a single observation was capable, and the fresh determination of a position of parellelism after every observation was too much trouble to be taken when not absolutely necessary. The reflecting circle of Mayer was not adopted in England, but great pains employed in constructing and dividing the sextant, in which our artists were eminently successful.

In France it is probable that the art of instrument-making was at this time less advanced, and therefore the merit of Mayer's principle more readily appreciated. The celebrated Borda, who was a seaman and navigator, first had an improved instrument on this construction made about 1775,* and published a full description of its form and use in 1787 (*Description et Usage du Cercle de Réflexion, par le Chevalier de Borda*, Paris, 1787), to which we refer the reader as a standard and classical work. The accompanying figure will explain Borda's instrument, though it is not precisely similar to that which he recommended.



Five-Inch Diameter.
Borda's Reflecting Circle, by Troughton and Simms.

The index-glass, with its bar, vernier, and tangent screw, and the excentric bar which carries the telescope, horizon-glass, with its vernier and tangent screw, require no explanation. The telescope has a parallel-ruler motion to bring the images to equal brightness, which is, we believe, Bird's construction. Borda holds his telescope by two ears, each of which can be raised or depressed separately, and he has a graduation for each, so as to move them equal quantities. Dollond, in his very beautiful repeating circles, has an up-and-down piece *above* the bar. The important and essential conditions of the repeating circle are, that moving one index shall in no way affect the other; that the clamps when fixed shall not be liable to move from looseness, bad balancing or bad centering when the position of the circle is changed; and finally, that the axis of the index-glass and the collar on which the horizon-bar turns shall both be so true, and of such a length, that the motions of each bar are parallel to the plane of the divided circle. The same precautions must be taken as in the sextant in trying the index and horizon glasses, in placing the prismatic edges of the dark glasses up and down alternately, in setting the glasses perpendicular to the plane of the circle, and the telescope parallel to it; and it is scarcely necessary to add that the directions given above for using dark glasses, equalizing brightness, &c., apply to one reflecting instrument as well as another. The cells into which the dark glasses are inserted, when wanted, are seen between the two glasses and also in front of the horizon-glass.

On looking at Borda's circle as it is here represented, the opening of the angle between the two glasses is towards the spectator; hence an observer looking through the telescope would see an object directly in the line of the telescope, and some other object, call it A, which lies towards the spectator, by reflexion. Now suppose the index bar to be moved through the position of parellelism and until the glasses make the same angle as before, but with the opening from the spectator, it is clear, first, that the angle read off between the first and second positions will be twice the original angle, and secondly, that the observer, still looking at the same object as before seen *directly*, will see by reflexion an object on his right hand (call it B), which makes the same angle with the axis of the telescope as A did, but on the other side. Now if we suppose the whole instrument to turn

* Borda's alterations were apparently very simple: he drew the [illegible] back until its object glass fell short of the index glass, while [illegible] jected beyond it, and he carried the horizon-glass forward almost [illegible] of the circle, which Mayer planted close before his telescope. Yet [illegible] slight modifications completely changed the instrument.

half round upon the telescope as an axis, it is evident that A will be seen exactly as at first, while the index-bar has been moved forwards twice the angle between A and the axis of the telescope produced. This is exactly the complete observation with Troughton's circle, and thus while we have got double the angle by two observations, we have got rid of index error, and have only two readings to which error of division and reading off can apply.[*] Now suppose the instrument to be returned to its original position, and, leaving the index-bar securely clamped, move the horizon-bar, which carries the telescope and horizon-glass, through the same angle and in the same direction as the index-bar has travelled. If the original object be again viewed through the telescope, and the contact between that and A perfected by the tangent screw of the horizon-bar, it is clear that everything is exactly as at starting, except that the index and horizon bar have each moved over the divided circle exactly twice the angle to be measured. Let the operation which has been described be repeated, and everything will be as at starting, except that the indices will have moved over four times the angle, and it is evident that there is no limit to the number of repetitions except the will of the observer. So that, theoretically at least, the influence of bad division, bad centering, and bad reading off upon the final angle may be reduced below any sensible quantity. There is another very considerable advantage, viz. that there are only two readings off of each vernier[†] for any number of repetitions.

On looking at the figure again it will be seen that the rays of light which fall on the index-glass pass *between* the telescope and the horizon-glass, and there is a particular angle at which they pass through the horizon-glass before falling on the index-glass. This occasions some inconvenience, as the reflected image in that case is scarcely ever quite perfect, and if the sun be the reflected object, the interposed dark glass increases the imperfection. When Borda's circle is used in the hand for observing altitudes, the instrument is to be held alternately in the left and right hand for the crossed observations, but in taking lunar distances there is the same difficulty as in the sextant when the face is downwards. A handle with curved tube may however be applied pretty much as in Troughton's circle, and if it is fixed into a collar which turns on the centre, it may be kept out of the way of the telescope, &c. There is a part of this circle which, though not actually necessary, will be found of great convenience, the graduated semicircular arc which is attached to the horizon-bar. The index-bar, either by its edge or by a fiducial line, points out the reading on the semicircle, and shows 0 on each side when the glasses are parallel. By the help of this it is easy to set roughly to any angle on one side or the other, and thus save the trouble which nice setting would require, or seeking for an object, which is still more troublesome. In some circles two small pieces which slide easily can be fixed on this semicircle, and the proper opening is given by the touch alone, that is, when the index-bar just feels the stop. But there is always a risk of forcing a clamp which is supposed to be fixed, by the slightest touch, and therefore we prefer setting by a coarse-reading. As the chronometer must be noted and read off at every observation, there will generally be light enough for this purpose. Borda's original circles were much too large, and very weak and ugly. Six inches diameter seems to us quite sufficient for an instrument of this construction, which is intended to be used according to its principle. The telescope and glasses are nearly the same for all sizes, and the repetition reduces the errors of division and reading off so rapidly that we should prefer rather a coarse division, which is easily seen, to a fine one. A boldly cut division to 30″ would probably be best for general purposes; the circle should be as light as is consistent with strength, but the main points to be looked to are the independence of the index and horizon bars, the truth and perpendicularity of the centerings, and the firmness of the clamps. Whether the want of balance in both bars, and especially the horizon-bar, is wholly innoxious, is a point of some doubt, otherwise there would seem to be no theoretical objection to a well-made repeating circle. Hitherto this instrument has not been much used in England. By some it may have been thought more troublesome than the sextant; it has generally been made too large and cumbersome, and perhaps prejudice may be added as one of the causes why it has not been properly valued. Mr. Dollond has however made several of late (somewhat varying from that here described), of a beautiful model and with very convenient stands. At the same time, though warm partizans of the repeating principle, we conceive that the results with a repeating circle will not be superior to those which *may* be attained by the sextant or by Troughton's circle when in the best hands, but it is more independent, requires less thought and care and skill than the sextant, and is neither so troublesome nor so cumbrous as Troughton's circle.

An alteration was proposed in Troughton's construction by Mr. Hasslar, director of the survey of the coast of the United States. The circle turns freely round the centre, and is clamped at pleasure either to the frame which supports the horizon-glass and telescope, or to the index-bar which carries the index-glass. The arrangement is exceedingly ingenious, but we suspect that the clamping and unclamping must affect each other, notwithstanding the beauty of the workmanship. They are also made much too heavy for the hand, and, considering the principle, unnecessarily so. Mr. Hasslar has employed them, we believe, in his survey, but we have not heard of their use elsewhere. The idea of a moveable or flying circle was probably taken from De Mendoza Rios, who proposed a flying vernier, as well as circle. ('Phil. Trans.,' 1801, p. 362.) The complication of this construction, and the practical objections to it, were, we presume, fatal to its adoption; for we are not aware that it has ever been successfully used. In observing altitudes at sea, it is presumed that the horizon is always visible, which in hazy weather, or in dark nights, is frequently not the case. There have been several proposals for overcoming the difficulty by adapting a plumb-line or level to the sextant when required.

Several modifications, additions, and supposed improvements have been made in this class of instruments, but none of sufficient importance to require notice here. The sextant and circle, such as we have described them, are sufficient for the cases which practically occur; and without disputing the ingenuity and even utility of certain modifications in peculiar and exceptional cases, we believe that there is little to be gained by such alterations as have been hitherto proposed.

For reducing observations made with reflecting instruments, we must refer to the usual works on nautical astronomy. The tables of Thompson, or Riddle, or Inman, or Raper, will afford sufficient information. Borda's memoir, already mentioned, should be carefully studied by every one who proposes to use a repeating circle; and Troughton's article CIRCLE, in Brewster's 'Edinburgh Encyclopædia,' will be found of great value, especially as a guide to the circle known by his name. We have ventured very frequently to modify their opinions and directions, and the intelligent reader may decide for himself.

SEXTON, an officer of the church, whose name is supposed to be a contraction of *sacristan*, the name of the person who in antient times had the care of the sacred vessels and other things used in religious services. The greater simplicity of Protestant ceremonies has rendered this duty one of small importance, and it is now usually performed by the parish clerk; so that the sexton has sunk into an officer whose chief business it is to see to the preparation of graves and to assist in depositing the corpses. To him also belongs the care of sweeping the church, and other similar menial offices.

SEXTUS EMPI'RICUS, a Greek philosopher and physician of celebrity, who flourished about A.D. 200. The particulars of his life are uncertain, and the only two indications on which we can rely are those given in his own works, that he was the pupil of Herodotus of Tarsus, and that he lived about the period before mentioned.

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[*] Some observers use the repeating circle as a sextant. They change the readings from time to time by altering the position of the horizon-bar and determining the zero position of the index-bar. This mode of observing will undoubtedly tend to destroy errors of division and excentricity, but it is a complete sacrifice of the best qualities of a repeating circle. At any rate index error should be destroyed in the way we have pointed out, which would be some compensation for the reduced radius of the divided arc. Borda calls the pair *observations croisées*, or *crossed observations*.

[†] The index-vernier is usually read off and the horizon vernier neglected. Lieutenant Raper has pointed out the following use of the second vernier. Place the glasses parallel and read off both verniers; then if you wish to measure two angles rapidly, observe one by moving the index-bar, and the other by moving the horizon-bar. In observing altitudes of two stars in uncertain weather and in maritime surveying, this recommendation may be of great service. Let the greater angle be first measured by moving the index-bar, then the angle moved over by the index-bar is the greater angle, and the difference between this angle and that moved over by the horizon-bar is the less angle.

Diogenes (ix., *Timon*) simply says, Sextus, the Empiric (ὁ ἐμπειρικὸς), was the pupil of Herodotus of Tarsus: he wrote the ten books of Sceptica, and other excellent works.' Equal uncertainty exists as to the place where he lived and taught, although, from the only existing evidence of value (viz. from a passage in his own work, Πυῤῥώνειαι Ὑποτυπώσεις, iii. 16), it appears that he taught philosophy and exercised his art, at least during one period of his life, in the same place as his master. But his very identity has been a matter of of dispute. Suidas (Σέξτος) speaks of Sextus, a native of Libya, to whom he attributes a work entitled 'Sceptica,' in ten books; but he also attributes ten books of 'Sceptica' to Sextus of Chaeronea, whom he calls a follower of Pyrrho, though it is well known that this Sextus, the nephew of Plutarch, and one of the preceptors of M. Aurelius, was a Stoic. That the philosopher of Chaeronea and Sextus Empiricus are two different persons is clearly shown by Kuster, in a note in his edition of Suidas (*in v.* Σέξτος χαιρωνεύς).

His surname of Empiricus, prefixed to his works, and given him by Diogenes Laertius, intimates that he belonged to that school of medicine which styled itself the Empiric; and he himself confirms this in his treatise πρὸς τοὺς Μαθηματικοὺς Ἀντιῤῥητικοί, *Adversus Mathematicos*, lib. i., 161.

His works are among the most valuable of those extant in antient philosophy, and have been largely consulted by all subsequent historians. The 'Pyrrhonian Hypotyposes,' in three books, contains all the celebrated arguments of the antient sceptics. [Scepticism.] The first book is a complete analysis of scepticism. He divides philosophers into dogmatists, academics, and sceptics, and then classifies the sceptics themselves. Next follows an exposition of the nature of scepticism, its method, endeavours, and aims: with a learned and precise account of all the celebrated terms in use amongst sceptics, such as ἐπέχω, 'I refrain from judging;' οὐδὲν ὁρίζω, 'I define nothing;' and others. This book is peculiarly valuable as an exposition, but is perhaps inferior to the two succeeding books, which are directed against the dogmatists, where, after stating every subject of belief, he opposes each of them with a string of sceptical objections. Morals, religion, logic, nothing escapes his doubt; and this is done in a manner at once peculiar and subtle, and affords an interesting exposition of the insufficiency of human reason to settle those illimitable inquiries of

> 'Fate, foreknowledge, free-will absolute,'

which have ever formed the 'vexatæ quæstiones' of philosophers. [Sceptic.]

The other work of Sextus Empiricus, which is entitled 'Adversus Mathematicos,' is only another form of the Pyrrhonic Institutes above mentioned. It is directed against all who admit the possibility of a science. This discussion, though conducted on very different principles, has been much in vogue amongst the German and French metaphysicians, and indeed involves the whole philosophy of human knowledge. What science is, whether science be possible, whether science be positive or psychological, these are questions eternally renewed. M. Auguste Comte, in that vast system which he has elaborated in his 'Cours de Philosophie Positive,' denies altogether the possibility of a psychological science; while the Germans, on the other hand (led thereto by the fundamental principle common to them all, that the external universe receives its laws from the laws of the mind), contend that all science must necessarily be psychological. But Sextus Empiricus sweeps away both parties, and will admit no science whatever to be possible. The first book of his 'Adversus Mathematicos' undertakes to refute grammarians and historians; the second annihilates the rhetoricians; the third, the geometricians; the fourth, the arithmeticians; the fifth, the astrologers; and the sixth, the musicians.

There are five more books always added to the work, all directed against logicians, moralists, and physicians (φυσικοί, in the Greek sense); but to make them part of the same work as the first five books can only have arisen from the ignorance and carelessness of his first editors. They have no real connection with them, but may rather be regarded as a supplement to the second and third books of the 'Hypotyposes,' to which they belong in intention as well as spirit. The two works are indeed closely allied in spirit, and are only various forms of the same philosophy and the same purpose.

Such as they have come down to us, these two works form an encyclopædia of scepticism such as can be found nowhere else. They are, as M. Ancillon well observes, 'a positive arsenal of every species of doubt methodically arranged, and from which the sceptics of succeeding times have armed themselves, choosing from his immense magazine the arms suitable to their minds or to the nature of their subjects.'

The influence of Sextus Empiricus, except as an historian, has been very small. The Alexandrian philosophy and the Christian religion alike combined by their success to prevent his forming a sect of any consequence; and although modern sceptics have availed themselves of his arguments to prop up their own incredulity, yet there is a tendency in the human mind at variance with this barren philosophy, which no ingenuity, however subtle or plausible, has ever been able to overcome.

There are few editions of Sextus, and none which can be called critical. The first translation of the 'Hypotyposes' was by Henry Stephens, 1562, 8vo. The first edition of the Greek text of both works was published at Paris, 1621, fol. This edition is accompanied with a Latin version. An edition of the Greek text, also with the Latin version, was published by J. A. Fabricius, Leipzig, 1718, fol.

SEXUAL SYSTEM. [Sexes of Plants.]

SEYCHELLE COCOA-NUT is the fruit of one of the palms (*Lodoicea Sechellarum*), respecting which many fabulous accounts were formerly related, such as, that it was produced at the bottom of the sea, the nuts being only found thrown up on the coasts of the Maldive Islands. They were called Coco de Maldivia or Coco de Salomon by the early Portuguese navigators. Many marvellous medical virtues were ascribed to these nuts by the physicians of the age, both Asiatic and European, and they were consequently sold at a high price. At present they form only objects of curiosity, and are well known under the name of double cocoa-nuts. The tree yielding them was first discovered by Barré, a French officer of engineers, in 1769, then described by Sonnerat, but for the first time accurately by Labillardière, 'Ann. Mus., Paris,' ix., p. 140, t. 13. A very full description and illustrative plates have been given by Dr. Hooker, in the 'Botanical Magazine,' N. S., No. iv., v., and vi., 1827; and a paper on the subject was lately read at the Royal Asiatic Society by a resident of the Seychelle Islands. To the inhabitants the tree is useful for its timber, which is hard externally, and employed in building their huts and for posts; the leaves and their footstalks are used for the roof, walls, and partitions, and for many other domestic purposes. The nuts weigh from 20 to 25 pounds each, and, when fresh, contain a white, transparent, and jelly-like substance, which is edible. The shells are employed in making vessels and dishes of various kinds, and the entire nuts form articles of commerce, as they are esteemed in other countries both for their fabled virtues and as curiosities.

SEYCHELLES ISLANDS are a group of islands situated in the Indian Ocean, north-east of Madagascar, between 3° and 5° S. lat. and 53° and 56° E. long. These islands rest on an immense bank of sand and coral, which is said to extend from north-west to south-east more than 240 miles, and in width between 30 and 90 miles. It is a kind of vast platform in the sea, on which the superstructure of the islands has been raised. The general depth of water on the bank varies between 12 and 40 fathoms. It is free from dangers, but the ground-swell is very great on it.

The number of islands, including the small islands, is nearly thirty, of which however only fifteen are of any importance from their size or produce.

Islands.	Acres.	Islands.	Acres.
Mahé . .	30,000	Marianne . .	250
Praslin . .	8,000	Conception . .	120
Silhouette . .	5,700	Felicité . .	600
La Degue . .	2,000	North Island .	500
Curieuse . .	1,000	Denis . . .	200
S. Anne . .	500	Vache . . .	200
Cerf . .	400	Aride . . .	150
Frigate . .	300		

The other islands are small, and only occasionally visited to obtain cocoa-nuts or turtles.

The surface of the islands is irregular, presenting a diversity of hill, rock, and ravine, without any extent of level land. The rocks are granitic; the soil is in some parts scanty, but good; it produces abundance of wild fruits and vegetables. Cultivation is carried on only in the narrow valleys, the soil there being deeper and richer than on the higher grounds, from which it is often washed down by the rains. The island of Mahé, which is the largest, and the residence of the government agent, is sixteen miles long and from three to four broad. The rugged chain of granitic hills which passes through its centre is about 400 feet above the sea in the highest parts. This island has much valuable wood, especially on the more elevated spots, which have not been cleared for cultivation. The Seychelles contain many excellent harbours, which are never visited by tornadoes, and may at all times be considered perfectly safe.

The climate is fine and healthy, and the heat is never oppressive. The thermometer generally varies between 84° and 64°, and the mean annual temperature is between 70° and 72°. The sea and land breezes are regular, but feeble, except in the month of August, when strong breezes occur. Gales of wind are very seldom experienced, and hurricanes are unknown.

The grains which are most cultivated are rice and maize. Mandioc is also grown, as well as cotton, coffee, tobacco, and the sugar-cane. There are a few clove-trees. Among the productions found in a wild state are cocoa-nuts, pine-apples, cucumbers, and red pepper. But the most remarkable production is the *coco do mar*, which for some centuries was considered to be the fruit of a tree which grew on the bottom of the sea, whence it took its name. [Seychelle Cocoa-Nut.] The inhabitants of the islands derive great advantages from this tree. Besides the fruit, which is eaten, though it is tasteless, the wood is used for many domestic purposes; the cabbage which is found at the summit of the tree, though bitterer than that of the common palm, makes an excellent pickle. With a hundred of its leaves a house may be built, and the majority of the houses in Praslin are made of them. The down of the leaves is put into mattresses and pillows; the stalks are formed into baskets and brooms; and the heart of the younger leaves is cut into narrow stripes, from which hats for both sexes are made, and generally worn in the island. The fibrous covering of the nut is manufactured into ropes, and the shell is universally used as a pitcher, many of them containing six or eight pints; divided longitudinally it makes plates and dishes for the slaves; and when small it forms drinking-cups. All attempts to transplant this tree to the other islands have hitherto proved fruitless. Another production which seems to be peculiar is called *bois rouge*, or *bois de Mahé*. It is not inferior in beauty and solidity to mahogany, and is well adapted for cabinet-work, but it is not found in sufficient quantity to become a great article of export. Cattle and sheep are rather numerous, and very good. Alligators are found in the wide mouths of several brooks. The flying fox, a large kind of bat of hideous aspect, is eaten, and is considered a dainty.

The population is composed of whites and negroes. In 1825 it consisted of

White persons	582
Free coloured persons . .	323
Slaves	6058
Total .	6963

The town of Mahé is situated on the north-east side of the island of the same name, in a small glen, irregularly built, and containing only a few good houses inhabited by persons of respectability, who generally prefer living in the environs. It is not far from a deep bay enclosed by a semicircle of tolerably high land; but the innermost part of the bay is occupied by shoals and coral rocks, which are partly dry at low water. The number of small trading vessels belonging to the island may be ten or twelve; they sail to the islands of Mauritius and Bourbon, and to India. They have also many large schooner-rigged boats, which they employ in communicating between the islands; and numerous canoes built and fitted with much skill and neatness. The inhabitants get the few articles of European manufacture which they are in need of from Mauritius and Bourbon, to which islands they send their produce, as also Mahé wood, wax, and tortoise-shell.

It is probable that these islands were known to the Portuguese under the name of the Amirante Islands, a term which now belongs to a much smaller group lying south-west of the Seychelles, consisting of several low small islands, which are uninhabited, and only visited occasionally for the turtles and cocoa-nuts with which they abound. The Seychelles were partially explored by Lazarus Picault, in 1743, by order of Mahé de la Bourdonnais, then governor of the island of Mauritius. The name of Seychelles is derived from Moreau de Seychelles, who was an officer of rank in the French East India service when they were first explored by the French. About the year 1768 the French formed a colony on the island of Mahé; and as about that time Poivre took much pains to transplant the spices of the Moluccas into the French colonies, they were also cultivated in Mahé; but they did not succeed, with the exception of cloves, of which there are still a few trees. The Seychelles capitulated to the English in 1794, but were not taken possession of. On the capture of Mauritius however in 1810, they were occupied; and by the peace of Paris (1815) formally ceded to England, together with Mauritius.

(Prior's *Narrative of a Voyage in the Indian Seas;* Owen's *Narrative of Voyages to explore the Shores of Africa, Arabia, and Madagascar.*)

SEYMOUR, EDWARD, First Duke of Somerset. [Edward VI.]

SEYMOUR, THOMAS, Lord Seymour of Sudley. [Edward VI.]

SEZANNE. [Marne.]

SFORZA, JA'COPO ATTE'NDOLO, born about the middle of the fourteenth century, at Cotignola, a village near Faenza, of humble parents, forsook in early youth his occupation of a labourer to enlist in one of those companies of adventurers which were then numerous about Italy, and which served for hire the highest bidder among the petty princes and republics of that age. Jacopo, having displayed great courage and perseverance, acquired a considerable reputation in that turbulent militia. After serving under several 'condottieri,' or leaders, he attached himself to Alberico da Barbiano, a captain superior to the rest both by birth and the loftiness of his views. Alberico belonged to the family of the lords of Cuneo, and aspired to the glory of delivering Italy from the foreign mercenaries and forming a national militia. Having collected a force of 12,000 men, all natives of Italy, he gave it the name of the Company of St. George. In the year 1376, pope Gregory XI., who was residing at Avignon, sent an order to his legate in Italy to endeavour to restore the authority of the Papal see over the towns of the Romagna, which had revolted at the instigation of the Florentines. The cardinal took into his pay a body of foreign mercenaries called the Breton Company, commanded by John Hawkwood, whom the Italians called 'Acuto,' a valiant condottiero of those times. These troops having entered Faenza without opposition, began plundering the town, and killed many of the people. In the following year the cardinal of Geneva was sent from France by the pope with another body of foreign mercenaries, chiefly cavalry, from Britanny and other parts of France; and having attacked Bologna without success, he wintered at Cesena. Here the soldiers, having come to blows with the citizens, were driven away with the loss of six hundred of their number; but soon after, having again got admission into the town, some say under a general amnesty granted by the legate, they set about sacking it, killing all the men, violating the women, and not sparing even the nuns. Four thousand of the unfortunate inhabitants of Cesena were killed on that day (1st of February, 1377), and eight thousand escaped to beg their subsistence in the neighbouring towns and villages. The report of these enormities spread indignation all over Italy; and Alberico, supported by Barnabo Visconti, lord of Milan, the Florentines, and by the people of Bologna, Forli, and other towns, marched to attack the foreign troops, which he met at Marino in the Papal state. Jacopo Attendolo, and Braccio da Montone, another distinguished pupil of Alberico, fought under him. After a desperate combat, the foreign mercenaries were utterly defeated and nearly annihilated. The Breton Company was entirely disbanded, and Italy, at least for a time, was freed from foreign mercenaries. Alberico was called the 'Liberator,' and he assumed on his standard the motto 'Liber. Ital. ab Exter.' Attendolo, who had greatly contributed to the victory, received from Alberico the surname of 'Sforza,' by which name, and no other, he and his descendants have become known in history.

Sforza subsequently entered the service of Gian Galeazzo Visconti, lord of Milan. Afterwards he engaged himself to the republic of Florence against the rival republic of Pisa, which had in its service Agnolo della Pergola, another celebrated condottiere. Sforza defeated his antagonist, and the Pisans were obliged to sue for peace. The Florentines made Sforza their captain-general, with an annual salary of twelve hundred golden ducats. He afterwards entered the service of the marquis of Ferrara against Ottobuono de Terzi, tyrant of Parma, whom he defeated, and treacherously stabbed to death at an interview at Rubiera. Such was the virtue of the condottiori. The marquis of Ferrara obtained by this means the dominion of Parma and of Reggio, and he rewarded Sforza by giving him the estate of Montecchio. Sforza afterwards served the Florentines against Ladislaus, king of Naples, whom he defeated near Arezzo. Ladislaus made large offers to Sforza to enter his service, which he accepted, and the king dying soon after, Sforza became great constable or commander-in-chief under his sister and successor Joanna II. At her profligate court the brave but blunt condottiere was exposed to the intrigues and cabals of worthless favourites, and he lost the good graces of his sovereign, and was imprisoned. But he was necessary to her, and he finally triumphed over his rivals. In the year 1417 he was sent by Joanna to Rome to recover possession of that city for the Holy See. The people of Rome, taking advantage of the schism, had risen in arms and asserted their independence, and the new pope, Martin V., who had just been elected by the council of Constance, was far away. The popular party had called in the celebrated condottiere Braccio da Montone, who however left the town on the approach of Sforza. After restoring the Papal authority, Sforza returned to Naples, where he was again banished from the court by the intrigues of Gianni Caracciolo, the then favourite of Joanna II. Sforza, at the head of his trusty men, took possession of Naples, and obliged the queen to banish Caracciolo. Shortly after he was sent again to Rome to assist pope Martin V. against his factious subjects, who were supported by Braccio da Montone, whom he defeated and obliged to ask for a truce. At this time the pope gave to Sforza his native village of Cotignola in fief, with the title of count. Having returned to Naples, he again incurred the displeasure of the fickle Joanna, upon which he took the part of Louis of Anjou, count of Provence, an hereditary claimant of the throne of Naples. The queen called to her assistance Alfonso, king of Aragon and of Sicily, whom she appointed her heir and successor. Alfonso came with a fleet and an army, defeated Sforza, and occupied the city of Naples. But Alfonso abused his victory, and he treated the queen as his prisoner. Sforza came to the assistance of his mistress, and drove away Alfonso. In the meantime Braccio da Montone was ravaging the northern provinces of the kingdom. Sforza marched into the Abruzzi in the midst of winter, but in fording the river Pescara, which was swelled by heavy rains, his horse was carried along by the rapid current, and Sforza was drowned. Thus ended the restless career of this brave but illiterate soldier, whose surname, acquired on the field of battle, became that of a sovereign dynasty.

Francesco Sforza, born in 1401, son of Jacopo, learnt the art of war under his father. He received from Queen Joanna the title of count, and several domains in the kingdom of Naples. He afterwards entered the service of Filippo Maria Visconti, duke of Milan. Being ill-rewarded by the duke, he accepted the offers of the Venetians and the Florentines, and led their allied forces against the Milanese, who were commanded by Piccinino, a celebrated condottiere, whom he defeated in several campaigns, A.D. 1438-41. The duke of Milan, in great alarm, offered Sforza his only daughter Bianca, with the city and territory of Cremona for a dowry. Sforza assented, concluded a peace between the belligerents, and the marriage was solemnised in October, 1441. But soon after the duke Filippo Maria, again becoming suspicious of his son-in-law, excited against him pope Eugenius IV., who sent Piccinino to deprive Sforza of his domains in the March of Ancona. Sforza repaired thither, and for several years fought against the troops both of the pope and of Alfonso, king of Naples, and conquered the greatest part of the March of Ancona. But the death of the duke his father-in-law opened a new field to his ambition, and he aspired to the sovereignty of the duchy of Milan. There were other pretenders, who alleged that Bianca was an illegitimate child of the late duke; and the people of Milan, considering the Visconti dynasty as extinct, proclaimed the republic. But Pavia and other towns which had been subjected by Milan detached themselves from it, asserting an equal right to their independence. Sforza turned these dissensions to his own account; he accepted the command of the Milanese troops, with which he defeated the Venetians, who wished to dismember the duchy; but having refused to obey the directions of the commissioners from Milan concerning his military movements, he suddenly concluded peace with Venice, and the Venetians agreed to give him 6000 auxiliary troops to take possession of Milan. In February, 1450, the people of Milan, reduced by famine, and distracted by anarchy within their walls, opened the gates to Sforza, who was solemnly proclaimed duke of Milan in the following March. In his new dignity he acted with prudence and mildness. He promised to raise no new taxes, to employ none but Milanese for civil offices, and he enforced the laws for the protection of persons and property; he made alliance with the Florentines, conciliated the Pope and Alfonso of Naples, and was acknowledged by Louis XI. of France. The Venetians and the Duke of Savoy declared war against Sforza; but after a desultory warfare, peace was made, by which Brescia, Bergamo, and Crema remained to Venice, and the river Sesia was fixed as the boundary between the duchy of Milan and the states of the house of Savoy. The duchy of Milan under Duke Sforza embraced the following towns:—Milan, Pavia, Cremona, Lodi, Como, Novara, Alessandria, Tortona, Valenza, Bobbio, Piacenza, Parma, Vigevano, Genoa, and Savona. The last two cities were conquered by Sforza.

Duke Sforza restored and embellished the ducal palace, raised the castle of Porta Giovia, terminated the magnificent structure of the great hospital, one of the most interesting buildings of Milan, and constructed the navigable canal, or Naviglio della Martesana, which communicates between Milan and the river Adda. The reign of Sforza lasted sixteen years. He died of dropsy, in March, 1466, at the age of sixty-five, generally regretted. In his private life he was frugal, sober and continent, affable and humane. His Life has been written by Simonetta, and Corio and the other historians of Milan record his virtues.

Galeazzo Maria Sforza, son of Francesco, who succeeded him on the ducal throne, was very unlike his father: he was suspicious, cowardly, licentious, and cruel. He quarrelled with his mother the duchess Bianca, a most meritorious woman, who retired to Marignano, where she died after a short illness, not without some rumours of poison. He put to a cruel death several innocent persons, and dishonoured many women of all classes. At last a conspiracy was formed against him, and on the day after Christmas-day, 1476, he was stabbed whilst on his way to church. The people took no part with the conspirators, who were put to death. His infant son Giovanni Galeazzo was proclaimed duke, under the guardianship of his mother Bona of Savoy. But Ludovico Sforza, styled 'il Moro,' on account of his dark complexion, and brother of the deceased duke, took possession of the regency, arrested the dowager duchess, put to death her faithful minister Simonetta, and at length usurped the sovereign authority, confining his nephew and his wife to their apartments. The young duke had married a granddaughter of Ferdinand, king of Naples, who remonstrated with Ludovico on his conduct, but to no effect. Ferdinand armed against him, and Ludovico, to avoid the storm, invited Charles VIII. of France to undertake the conquest of the kingdom of Naples. This was the origin of all the wars and calamities of Italy in the sixteenth century, and of the loss of its political independence. Charles came into Italy assisted by Ludovico, and took Naples, but was soon obliged to retire in consequence of the general hatred of the people to the French for their insolence, rapacity, and oppression. Meantime the duke of Orleans seized upon Novara, and laid some hereditary claims to the duchy of Milan. Ludovico, who now saw the danger of having introduced the foreigners into Italy, formed a league with the Venetians and the pope, and drove away the French out of Italy.

After the suspicious death of Duke Giovanni Galeazzo, which happened in 1494, at the early age of five and twenty years, Ludovico was proclaimed duke of Milan, and confirmed by a diploma of the emperor Maximilian I. But the duke of Orleans, having become king of France by the name of Louis XII., sent an army to the conquest of the duchy of Milan, under Trivulzio, a Milanese noble, and a personal enemy of Ludovico Sforza. The Venetians and pope Alexander VI. having joined the French, Sforza was obliged to yield to the storm, and he took refuge in Germany.

The French entered Milan in 1499, without opposition and Louis XII. was proclaimed duke of Milan. The French however soon became as odious in Lombardy as they had been at Naples, and insurrections took place in several towns. In January, 1500, the people of Milan revolted, and in the following February Ludovico Sforza re-entered his capital. The French however kept their ground in the fortresses, and new reinforcements coming from France, Ludovico marched against them to Novara, but being forsaken by a body of Swiss in his pay, who, through an intrigue of the French, had received orders from their government not to fight against their countrymen who were in the opposite army, he was defeated and taken prisoner, and sent to France, where he was imprisoned in the castle of Loches till 1508, when he died.

Ludovico had several good qualities; he was generous, fond of the arts and of learned men; he was the friend of Bramante and Leonardo da Vinci, with whose assistance he embellished Milan, built the lazzaretto, instituted the public schools, protected Merula, Calchondylas, and other distinguished scholars, and founded chairs of Greek, geometry, and astronomy. Ludovico's policy was artful and crooked; he had obtained the ducal throne by unfair means, but it was unfortunate for Milan that he lost it to make room for strangers. After many years of war in Italy between French, Germans, and Spaniards, during which his two sons Maximilian and Francis Sforza were for short periods seated on the ducal chair, being puppets in the hands of their Swiss or German auxiliaries, Lombardy became finally an Austrian dependency, and the house of Sforza became extinct.

'SGRAVESANDE, WILLIAM JACOB, a Dutch mathematician and philosopher, whose family name was Storm van 's Gravesande, was born at Hertogenbosch (Bois-le-duc), September 27, 1688. On the side of his grandmother he was descended from the celebrated physician Jean Heurnius, and some of his ancestors had been magistrates of Delft in the beginning of the fifteenth century.

He received his earliest education in his father's house, and while very young he showed a decided predilection for scientific researches. When sixteen years old he was sent to the University of Leyden to study the law, and before the end of 1707 he took the degree of doctor. His legal studies did not however prevent him from applying himself to mathematical subjects, and before he was nineteen years of age he published his 'Essai sur la Perspective;' a work which was favourably noticed by John Bernoulli, and contains a development of the ingenious idea, that if a horizontal or an equatorial dial be viewed through a plane inclined in any manner, by an eye at the extremity of the gnomon, the perspective representation of the dial on that plane will constitute a dial for the same plane. (Montucla, *Hist. des Mathématiques*, tom. i., p. 733.) 'SGravesande, on his return to the Hague, followed for a time the profession of a barrister, but in 1713, a society of young men of talent having undertaken a work entitled 'Le Journal Littéraire,' he became one of its most zealous contributors, and furnished for it numerous extracts from works relating to mathematics and natural philosophy. He also published in the journal a paper on the construction of the air-pump (in which machine he had made some improvements), one on the theory of the collision of bodies, and several other original dissertations. The work was afterwards carried on at Leyden under the title of 'Journal de la République des Lettres,' and it terminated in the year 1733.

'SGravesande accompanied, as secretary, the deputies of the States-General when they came to London in 1715, in order to congratulate George I. on his accession to the throne of England. Here he became acquainted with Dr. Burnet, bishop of Salisbury, and was made a Fellow of the Royal Society; and after his return to the Hague he was made, in 1717, professor of mathematics and astronomy in the university of Leyden. During the vacations of the years 1721 and 1722 he made two journeys to Cassel, in consequence of invitations from the landgrave of Hesse, who wished to have the benefit of his advice respecting a machine which was supposed to be capable of perpetual motion, and who besides had manifested an enlightened taste for experimental philosophy.

In 1724 'SGravesande, on quitting the chair of mathematics at Leyden, delivered an oration which, under the title 'De Evidentia,' he afterwards printed at the head of the third edition of his 'Elémens de Physique.' In this he ascribes the pre-eminence to mathematical evidence, considering it as the only criterion of truth; and he makes the sanction of moral evidence consist in the will of the Deity, by whose law he supposes that man believes the testimony of his senses and trusts in the conclusions drawn from analogy.

In 1730 'SGravesande added civil and military architecture to the subjects which he taught, and four years afterwards he undertook to give instructions in a course which comprehended logic, metaphysics, and moral philosophy. From attachment to his country 'SGravesande declined, in 1724, an invitation from Peter the Great, who wished him to become a member of the Royal Academy then recently formed at St. Petersburg; and, in 1740, a similar invitation from the king of Prussia. He was occasionally employed as an engineer in superintending the hydraulic operations which were executed in Holland. He was also consulted by the ministers of the States when measures relating to finance were in contemplation; and having a great facility in discovering the key to secret writing, he was of great service during the war of the Succession in decyphering such of the enemy's despatches as happened to be intercepted.

This distinguished professor was the first who, on the Continent, publicly taught the philosophy of Newton, and he thus contributed to bring about a revolution in the physical sciences, but he is said to have been more skilful in making observations and experiments than in conducting transcendental researches; and falling into an error respecting the nature of force, by confounding what is called living or active force, which is represented by the product of a body's mass multiplied into the square of its velocity, with simple force, which is proportional to the velocity merely, he was led to adopt the opinion of Leibnitz on this subject, in opposition to that of Newton. It is further observed that 'SGravesande, whose philosophical lectures are distinguished by a simplicity which is the true language of science, was not always consistent in the development of his ideas. His 'Introduction to Philosophy' is the work of a disciple of Locke, yet he neither adopted the particular doctrines of that writer, nor did he propose any system of his own, but he borrowed by turns the principles assumed by different philosophers.

He married in 1720, and had two sons, whom he had the misfortune to lose within eight days of each other, when the eldest was fourteen and the other thirteen years of age. He supported this heavy affliction with the fortitude of a Christian philosopher; and after a long sickness he died, February 28, 1742, being then in the fifty-fourth year of his age.

The principal works of 'SGravesande are the 'Essai de Perspective,' 1711; 'Physices Elementa Mathematica,' &c., of which the first edition was published at the Hague in 1720, and the sixth, which is in English, by Dr. Desaguliers in 1747; 'Philosophiæ Newtonianæ Institutiones in usus Academicos,' an abridgement of the preceding work, Leyden, 1723; 'Matheseos Universalis Elementa,' &c., Leyden, 1727; 'Introductio ad Philosophiam,' &c.: of this the first edition was published in 1736, and the last in 1756. He also edited a collection of the works of Huygens, and the 'Arithmetica Universalis' of Newton.

SHAD. [Clupeidæ.]

SHADDOCK. [Citrus.]

SHADWELL. [Middlesex.]

SHADWELL, THOMAS, a dramatic author, well known as the hero of Dryden's satire of 'Mac Flecknoe,' was born in Norfolk in 1640, of an antient Staffordshire family. He was bred to the law, but disliking the drudgery of an office, he quitted it and travelled abroad. On his return to England he became intimate with the reigning wits, and particularly with Rochester, Otway, and Dryden. He shortly after produced his first comedy of 'The Sullen Lovers,' which was so well received that he continued in this dramatic career, and became so notable a man as to be set up by the Whigs as a rival of Dryden. In 1688, on the secession of Dryden from the poet laureatship, Rochester recommended Shadwell to the place. He died in 1692, it is said in consequence of too large a dose of opium, which he was in the habit of taking. His dramatic works are—'The Sullen Lovers,' 1688; 'The Royal Shepherdess,' 1669; 'The Humourist,' 1671; 'The Miser,' 1672; 'Epsom Wells,' 1673; 'Psyche,' 1675; 'The Libertine,' 1676; 'The Virtuoso,' 1676; 'Timon of Athens,' 1678; 'A True Widow,' 1679; 'The Woman Captain,' 1680; 'The Lancashire Witches,' 1682; 'The Squire of Alsatia,' 1688; 'Bury Fair,' 1689; 'The Amorous Bigot,' 1690; 'The Scowerers,' 1691;

been represented in very opposite lights; but it appears that, without much knowledge of law, his natural sagacity enabled him to do substantial justice in most cases that came before him, and to acquit himself to the satisfaction both of the public and the profession. Roger North, in his 'Examen,' asserts that he began by trampling on all the forms of his court, and cutting and slashing after his own fancy; but the bar, he adds, 'soon found his humour, and let him have his caprice, and after, upon notice, moved him to discharge his orders; and thereupon, having the advantage, upon the opening, to be heard at large, they showed him his face, and that what he did was against common justice and sense; and this speculum of his own ignorance and presumption, coming to be laid before him every motion-day, did so intricate and embarrass his understanding, that in a short time, like any haggard hawk that is not let sleep, he was entirely reclaimed.' So that, as Roger expresses it, in the Life of his brother, the Lord Keeper Guilford, he came, as is said of the month of March, 'in like a lion and out like a lamb.' It is asserted however that none of his decrees were reversed. The tribute which Dryden pays to both his integrity and his ability as a judge, in the otherwise severe character he has drawn of him in his 'Absalom and Achitophel,' is well known:—

> 'In Israel's courts ne'er sat an Abethdin
> With more discerning eyes, or hands more clean;
> Unbribed, unsought, the wretched to redress,
> Swift of dispatch, and easy of access.'

Shaftesbury retained the seals till November, 1673, when he was dismissed from office, no doubt by the influence of the Duke of York and the popish party in the cabinet, whose confidence or good-will he had never been able to conciliate, although the ready and cordial manner in which he had lent his support to some of the most unpopular measures of the court had at the same time gone far to deprive him of the favour of the public. Among the most remarkable parts of his political conduct while chancellor are his compliance with the king's command to issue writs for supplying vacancies in the House of Commons during the prorogation of parliament; his strenuous advocacy of the war with Holland, to which in his speech delivered at the opening of the session in February, 1673, he applied the famous expression of Cato, 'Delenda est Carthago,' calling further upon his hearers to remember that the states of Holland were England's eternal enemy both by interest and inclination; and his eager and effectual support of the Test Act, which was passed in that session. Of the Corporation Act, passed twelve years before, it chances that he had been a decided opponent.

On his dismissal from office, Shaftesbury at once openly joined the ranks of opposition, and applied all his activity and talent of intrigue to thwart the measures of the court. By taking up the cry of No Popery, and holding himself up as the martyr of his zeal for Protestantism, he speedily regained his old popularity; and in the session which began in January, 1674, the House of Commons showed from the first day of its re-assembling what a powerful party his friends constituted there. Indeed they proved to be the majority of the House, the proceedings of which the ministers could find no way of checking except by resorting to a prorogation, which they continued from time to time till it had lasted for the unprecedented space of fourteen months. And when the House was found to be in no better humour after parliament had at length been suffered to meet again, in April, 1675, it was prorogued anew in June, and then, after another short session, which began on the 13th of October, was at once prorogued to the 15th of February, 1677, or for above fifteen months. When it re-assembled, Shaftesbury contended in his place that the parliament had been actually dissolved by being so long kept in a state of suspension; upon which it was voted that he should acknowledge his error and beg the king's pardon on his knees at the bar, and, when he refused to do this, he was committed to the Tower. He applied to the Court of King's Bench, and repeatedly petitioned both the king and the House of Lords; but he was not released till he at length consented, after an imprisonment of above a year, to make the submission originally required. In November, 1680, the House of Lords resolved that these proceedings were 'unparliamentary from the beginning and in the whole progress thereof,' and ordered them all to be obliterated from the journals of the House. The Earl of Salisbury, Lord Wharton, and the Duke of Buckingham, who had committed the same offence in the debate on the prorogation, had been all sent to the Tower along with Shaftesbury; but they were liberated on petitioning his majesty after a few months' detention.

The oppressive usage he had been subjected to at once embittered Shaftesbury's hostility to the court and made him more formidable than ever by the accession of public favour which it procured him. Soon after his release occurred the strange affair of Titus Oates and the alleged Popish Plot; when Shaftesbury took so eager a part in maintaining the truth of the story, that some writers have been inclined to suspect that it was all a contrivance of his own. But even those who acquit him of this charge are far from unanimous in holding that he actually believed in the existence of the plot, although he turned it to much account in the promotion of his party or personal objects. When the new council, consisting of thirty members—fifteen the existing chief officers of state and of the household, ten other members of the House of Lords, and five selected from the House of Commons—was established in the early part of 1679, Shaftesbury was made its president. It was immediately after being placed in this position that he drew up and carried through parliament the famous act for the better securing the liberty of the subject, now known as the Habeas Corpus Act, but in those days commonly called Lord Shaftesbury's Act. In October following however he was dismissed from his office of president of the council; and soon after, by his advice, Lord Russell, Lord Cavendish, and two others of his friends resigned their seals at the board. Shaftesbury now, on the 26th of June, 1680, took the bold step of appearing at the bar of the Court of King's Bench, and formally presenting the Duke of York to the grand jury as a Popish recusant. The grand jury were sent for by the court, and dismissed while they were considering the indictment; but when the king found it expedient to allow the parliament to meet again in October, after having been prorogued since July of the preceding year, the bill for excluding the Duke from the throne, which had been brought forward in the last session, was again passed by the Commons; and a new prorogation was had recourse to in January, 1681. Then followed the Oxford parliament, which was found equally intractable with its predecessors, and was put an end to in the same manner. For some time before this, Shaftesbury had been in close alliance with the Duke of Monmouth; and it is said to have been by his advice that Monmouth had recently returned from Holland, in defiance of his father's injunctions. It is supposed that Shaftesbury, in his hatred of the Duke of York, or his conviction of the dangers to be dreaded from his accession, had made up his mind to support the pretensions of Monmouth to the throne, on the ground of an alleged marriage between his mother and Charles. Alarmed by these designs, the court resolved to make a bold effort to destroy the powerful demagogue; and on the 2nd of July, 1681, Shaftesbury was seized by an order of council at Thanet House, in Aldersgate Street, and, being brought before the king and council, was committed to the Tower on a charge of high treason. But when the bill of indictment was preferred against him at the Old Bailey, on the 24th of November, the grand-jury ignored it. It is said that the applause in the court upon this announcement lasted a full hour. Dryden, who had a short time before celebrated the union of Monmouth and Shaftesbury, in his 'Absalom and Achitophel,' now wrote his much more acrimonious satire of 'The Medal,' in reference to a medal which was struck in honour of his lordship's deliverance.

Shaftesbury however seems now to have felt that there was no safety for him under the present system of things in England—that he had involved himself too deeply in the contest with the government to hope that they would ever rest till they had effected his destruction. In these circumstances he attempted to prevail upon his friends to join him in an armed insurrection; and upon their refusal, he fled to Holland, on the 18th of November, 1682. Here he took up his residence in Amsterdam, where an attack of the gout in his stomach put an end to his life on the 21st of January, 1683.

Lord Shaftesbury was three times married, and left a son, who succeeded him in his titles, by his second wife Frances, daughter of David Cecil, third earl of Exeter.

Few losses of the kind are more to be regretted than that of the Memoirs of his own time, which Shaftesbury is said to have written, and Locke, to whom he had committed the manuscript, to have destroyed in the fright into which he was thrown by the execution of Algernon Sydney. There is a short biographical account of Shaftesbury in Locke's works; but the most complete Life of him is that drawn up under the direction of his great-grandson, the fourth earl, by Mr. Benjamin Martin and Dr. Kippis, an impression of which was printed towards the end of the last century, all the copies of which are said to have been destroyed except two, from one of which the work was reprinted in 1836, in 2 vols. 8vo., under the superintendence of Mr. C. W. Cooke, by whose name it sometimes passes.

SHAFTESBURY, ANTHONY COOPER, THIRD EARL OF, born at Exeter House, London, in February, 1671, was the son of Anthony Cooper, second earl, and consequently the grandson of the subject of the preceding article, whose favourite he was from childhood, and who is said to have himself superintended his education in his earliest years. The method he took to instruct him in Greek and Latin was to place him while yet very young under the charge of a female of the name of Birch, who is affirmed to have had so great a knowledge of these languages that she spoke both with considerable fluency, and enabled the boy to read them with ease by the time he was eleven years old. He was afterwards sent to Winchester, and then spent some years in travelling on the Continent, whence he returned to England in 1689. In 1693 he entered parliament as one of the members for Poole, and took a considerable share in the business of the house on the Whig side; but his health suffering from his close attendance, he resigned his seat in 1698, and went over to Holland, where, assuming the character of a student of medicine, he made the acquaintance of Bayle, Le Clerc, and other distinguished literary persons. His father dying the following year, he returned home; and he made a considerable figure in the House of Lords during the short remainder of the reign of King William. Soon after the accession of Anne, however, he again retired to Holland; and, although he came back to his native country after an absence of two years, he never again took any part in public life. His last years were entirely dedicated to literature. In 1708 he published his 'Letter on Enthusiasm;' in 1709, his 'Moralists, a Philosophical Rhapsody;' the same year his 'Sensus Communis, or Essay on Wit and Humour,' in which he announced his famous doctrine of ridicule being the test of truth; in 1710, his 'Soliloquy, or Advice to an Author;' in 1711, a collected edition of all these works. The state of his health had now become so alarming that he was induced once more to leave England for a milder climate; he proceeded to Naples, and was enabled for some time to resume his pen, but at last sunk and died there on the 15th of February, 1713. A complete collection of his various pieces, which he had employed his last days in preparing, appeared soon after his death, in three volumes, under the title of 'Characteristics of Men, Manners, Opinions, and Times.'

Lord Shaftesbury's writings excited great attention and admiration in his own day; and his name still remains a considerable one in the history both of English philosophy and English eloquence. He appears to have bestowed unwearied pains upon his diction; but although he abounds in ingenious, forcible, and even brilliant passages, he failed to attain the crowning art of concealing his art, and his composition has for the most part an air both of effort and affectation. His philosophy as a system has little claim to originality; but it is animated by a lofty spirit of antient wisdom and beauty; and is full of glimpses and hints of important and sometimes new truths. 'The noble author of the "Characteristics,"' Warburton has said, while expressing his repugnance to the general character of Shaftesbury's philosophy, 'had many excellent qualities both as a man and a writer. He was temperate, chaste, honest, and a lover of his country. In his writings he has shown how much he has imbibed the deep sense and how naturally he could copy the gracious manner of Plato.'

Lord Shaftesbury married, in 1709, his relation Jane, daughter of Thomas Ewer, Esq., of Lea in Hertfordshire; and by this lady, who survived till 1751, he left one son, Anthony, the fourth earl. His own mother was Lady Dorothy Manners, daughter of John, first duke of Rutland.

SHAG. [PELECANIDÆ, vol. xvii., p. 384.]

SHAGREEN (French, *Chagrin*; German, *Schagrin*; Russian, *Schagrim*), a sort of leather, grained so as to be covered with small round pimples or projections. It is very hard, and is used as a covering for small cases and boxes, and for other purposes. It is prepared in Russia, especially at Astrachan, in Poland, and in various parts of the Levant. It is made chiefly of the skin of horses, asses, and mules. A piece of the skin of the back, immediately above the tail, is the part selected as most suitable. The skin is soaked in water, scraped, and stretched on frames: while soft, small seeds, such as mustard seeds, are pressed into it, and is is then dried with the seeds in it. The seeds are afterwards beaten out, and the skin has then that pimpled graining which is peculiar to the leather. It is afterwards polished, soaked in a ley, and dyed of various colours. Though very hard, it is easily softened in water, and is therefore easy to work. The best kind is said to be brought from Constantinople.

SHAH-ALIM I. (also called *Sultan Moazim* and *Bahadur Shah*) succeeded as emperor of India on the death of Aurungzebe, of whom he was the oldest surviving son (A.D. 1707, A.H. 1119). During the life of his father he had been entrusted with various important commands; but his uniformly unassuming deportment failed to disarm the jealous suspicions with which Aurungzebe habitually regarded his sons, and he was at one period, for nearly seven years, kept under restraint. At the outset of his reign he had to sustain a contest with his two brothers, Azim and Cambakhsh, who were dissatisfied with the splendid appanages, the kingdoms of Beejapoor and the Dekkan, bequeathed them by their father; but these ambitious princes were successively defeated and slain, leaving Shah-Alim without a rival. The remainder of his short reign presents few events of importance, being chiefly occupied by operations against the Sikhs, who had lately exchanged the character of peaceful devotees for that of armed fanatics, and had overrun the Punjab and adjoining provinces. He died in a fit, in his camp before Lahore, at the age of seventy (lunar) years, Feb. 16, 1712 (A.H. 1124), and was succeeded, after a short civil war, by his eldest son Jehandar-Shah. His character is summed up by an able native historian, Meer Hussein-Khan, with a frankness which singularly contrasts with the adulation usual in Eastern writers: 'This emperor was extremely good natured, and mild even to a fault; but very deficient in firmness, for which quality indeed the princes of the house of Timour have never been remarkable in later times.'

SHAH-ALIM II. succeeded to the nominal rank of emperor on the murder of his father Alimghir by the vizier Ghazi-ed-deen, Nov. 1759 (A.H. 1173); a fate which he himself had only escaped by flying from Delhi some time previous. He spent several years in the vain attempt to establish his authority in some of the provinces of the distracted empire, and is often mentioned by English writers of that period under the name of the *Shahzadeh*, or prince; but in 1755 he was compelled to throw himself on the protection of the British, who assigned him the city and district of Allahabad for his maintenance, receiving in return a formal grant of Bengal, Bahar, and Orissa, the original *title-deed* of the Anglo-Indian empire. His impatience to return to Delhi however led him to throw himself into the arms of the Mahrattas in 1771; but he found himself merely the tool of his new allies, and after various vicissitudes, he was seized and blinded (1788) by a Rohilla chief named Gholam Khadir, who had taken Delhi. The recovery of the capital by Madajee Sindiah restored him to liberty, but he continued virtually a captive of the Mahrattas till the capture of Delhi by Lord Lake in 1803, when he was rescued from the miserable and degraded state to which he had been reduced, and assigned an annual pension of 120,000*l.* for his support. He died in 1806, aged eighty-seven, and was succeeded by his son Akbar Shah II., who continued an English state pensioner all his life, and never exercised authority beyond the palace walls. Akbar died at the age of eighty-two, Sept. 28, 1837, and his son Mohammed Bahadur Shah, is the present titular monarch.

SHAH NAMEH. [FIRDUSI.]

SHAHABAD, a considerable town in Hindustan, in the territory of the king of Oude, in 27° 40′ N. lat. and 79° 53′ E. long., about 85 miles north-west from Lucknow, and about 18 miles south from Shahjehanpoor, direct distances. There are many large houses and remains of fortifications.

SHAHEE, Lake. [AZERBIJAN; PERSIA.]

SHAHJEHAN, or *King of the World*, the title assumed by Khurrem-Shah, the fifth of the Mogul emperors of India, who succeeded his father Jehanguîr Selim Shah, A.D. 1627 (A.H. 1037). He had borne a distinguished part in the transactions of his father's reign, and had the glory (1614) of first reducing the Rana of Oodipoor, the chief of the Rajpoots, to submission; and in 1616 he was declared heir to the throne, though he had then two elder brothers living, both of whom however died before Jehanghîr. He was afterwards employed against Candahar and the Dekkan, and distinguished himself by his bravery and military skill; but the intrigues of the famous empress Noor-Jehan, who favoured the pretensions of a younger prince named Shahriyar, led to his disgrace and recall. He was even driven for a time (1623) into open rebellion, and was never entirely reconciled to his father. On the death of Jehanghîr however the succession was secured to Shahjehan by the fidelity of the vizier Azof-Jah, and Shahriyar was taken and put to death. The revolt in the following year (1628) of a powerful chief named Khan-Jehan Lodi, who took refuge with the independent Moslem kings in the Dekkan, gave rise to a war in that quarter which lasted several years, and ended in the total subjugation of the kingdom of Ahmednuggur (1631), while the more powerful states of Beejapoor and Golconda were compelled (1636) to pay tribute to the court of Delhi. A war with the Uzbeks in Balkh (1644-7) was attended with little result; and Candahar (which, after falling into the hands of the Moguls in 1637, had been recovered ten years later by the Persians) defied all the efforts of two successive armaments, led by the princes Dara-Sheko and Aurungzebe, to retake it. The war in the Dekkan was renewed in 1655; and Aurungzebe, who was viceroy in the south, gained great advantages over the two kingdoms which remained, Beejapoor and Golconda. But a dangerous illness, which seized Shahjehan in 1657, led to a premature civil war between his four sons for the succession. The eldest, Dara-Sheko, had been destined by his father for the heir; but he was overthrown by the united forces of Aurungzebe and Morad, who entered Agra (1658), and deposed their father, while Aurungzebe, speedily getting rid of Mourad, proclaimed himself emperor. Shoojah, the fourth brother, was shortly after defeated and driven out of India; and Dara, being taken prisoner the next year in a fresh attempt, was put to death by order of Aurungzebe. From this period Shahjehan was confined by his ungrateful son to the citadel of Agra, though constantly treated with respect and allowed an ample establishment. He died there, Dec. 1666 (A.H. 1076), in the seventy-fourth year of his age. The reign of Shahjehan was the epoch of the greatest splendour and prosperity of the Mogul dynasty, though its *territory* was afterwards greatly extended by Aurunzgebe. The wise regulations introduced by Akbar for securing impartial justice to all classes of his subjects, Hindu as well as Moslem, were still in full force; and Tavernier, who visited India during this reign, says that Shahjehan 'reigned not so much as a king over his subjects, but rather as a father over his family and children.' The magnificence of his court was unequalled even in the tales of oriental pomp. The famous *peacock throne*, the jewels composing which were valued at 6,500,000*l.*, was constructed by his orders; but the most durable monuments of his greatness are the numerous and splendid public buildings which he erected. The city of New Delhi, or Shahjehanabad, with its fortified imperial palace and noble mosque, was built under his direction; but the superb mausoleum of the Taj-Mahal near Agra, which he built for the sepulchre of his favourite queen, and in which he himself lies interred, is unsurpassed perhaps by any edifice either in Europe or Asia for chaste elegance of design and beauty of execution. Notwithstanding this vast expenditure, his finances were so well regulated, that after defraying the cost of his military expeditions, and maintaining an army of 200,000 men, he left the treasure of 24,000,000*l.* (Khafi-Khan), the savings of an annual revenue of from 25,000,000*l.* to 30,000,000*l.* But all this prosperity greatly declined under Aurungzebe, whose bigotry led him to renew the oppression of the Hindus, and whose resources were exhausted by the civil wars to which this gave rise, and by his insatiable thirst for conquest.

SHAHJEHANPOOR, a town of Hindustan, in Rohilcund, in 27° 54′ N. lat. and 79° 50′ E. long., about 100 miles north-north-west from Lucknow, direct distance. It is in the British Territory, and is the residence of a British judge. It is seated on the Gurruck, a quiet winding stream. The town is large, and contains about 50,000 inhabitants. There is a castle, and some stately old mosques, most of which are ruinous; but the houses are in good condition, and the bazaars have an appearance of activity and opulence.

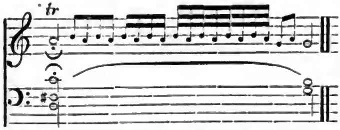
There is another town called **SHAHJEHANPOOR** in Malwa, in 23° 26′ N. lat. and 76° 18′ E. long. The name of both the towns is derived from the emperor Shahjehan, by whom they were founded.

SHAH ROKH BEHADIR, called also *Shahrokh Mirza* (*Behadir* signifying 'a champion,' and *Mirza* 'a princo'), was the fourth son of Tamerlane. The news of his birth was brought to his father, it is said, while he was playing at chess, and when he had just given check to the king (Shah) with his castle (Rokh): from these two words the name of the son was formed. He succeeded his father A.H. 807 (A.D. 1405), and was engaged during the greater part of his life in wars with Cara Yousuf, a Turcoman prince of the dynasty of the Black Sheep, and with the sons of this potentate. He defeated the father in three different battles, and was equally successful against his two sons Jehanshah and Iskender. He however restored the province of Azerbijan to Jehanshah, whom he made his tributary, and left Iskender to wander from province to province. In A.H. 818 (A.D. 1416), Shah Rokh restored the famous fortress of the city of Herat, which his father had laid in ruins, employing upon this work 7000 men. He also rebuilt the walls of Herat itself, as well as those of Merou; the latter had been in ruins since the irruption of Gengis Khan.

The children of Shah Rokh were: Ulug Beg, who governed Mawarannahar, or the ecuntry beyond the Oxus; Abulfatha Ibrahim, who governed Persia during the lifetime of his father, and died twelve years before him, leaving behind him many public works, amongst others a college; he had deservedly the reputation of a liberal patron of literature; Mirza Baisankar, or Baisangor, who also died in his father's lifetime, a year before his brother just mentioned, leaving three children, who reigned separately or jointly, and waged the most bloody wars with one another; Soyurgatmish, who commanded under his father in India and the country of Gazneh, and died A.H. 830 (A.D. 1427); and Mirza Mohammed Jouki, who died A.H. 848 (A.D. 1445). The Transoxan provinces given to Ulug Beg had been previously held by Mirza Khalil Sultan, grandson of Tamerlane and nephew of Shah Rokh, who confirmed him in this government. But of this ho was despoiled by a rebel courtier, who kept him prisoner; and on the death of the rebel, the provinces of Persian Irak and Azerbijan were given to the restored prince in lieu of his original territory. Shah Rokh himself died after an illustrious reign of forty-three years, at the ago of seventy-one, at Ray in Persia. (D'Herbelot, *Bibliothèque Orientale.*)

SHAH-ZEMAUN (*King of the Age*) became king of Cabul and Afghanistan on the death of his father Timour Shah, A.D. 1793 (A.H. 1208), in spito of the opposition of his elder brother Humayoon: another brother, Mahmood, was also defeated in battle and driven into Persia. The Durrauni kingdom had fallen into great disorder during the indolent reign of Timour; but instead of bending his efforts to re-establish subordination in his dominions, he became possessed with the ambition of emulating the Indian conquests of his grandfather Ahmed Shah, expelling the Mahrattas from Delhi, and restoring the ascendency of the Moslems. With these views, and encouraged by the invitation of tho Rohillas, he three times (in 1795-96-98) invaded the Punjab and occupied Lahore; but though his movements occasioned considerable alarm to the Mahrattas (who remembered their former defeats by the Afghans), and even to the British in Bengal, who assembled a force on their frontier to check his progress in case of need, he was in each instance recalled by the attacks of the Persians and Uzbeks on the north and west, and by the renewed attempts of his brother Mahmood on the crown. The unpopularity of the vizier Wuffadar Khan detached many nobles from the king's party; and the desertion of Futteh Khan, the powerful chief of the Barukzyes, enabled Mahmood, in 1800, to possess himself of Candahar. A force sent against him was dispersed; and Shah-Zemaun, flying towards Cabul, was treacherously seized and given up to his brother, by whom he was blinded and imprisoned. Mahmood now became king, but was dethroned in his turn, after two years, by Shah-Shoojah-al-Mulk (the lately restored prince), who was full brother to Shah-Zemaun. The latter was now released and treated with kindness; but when Shoojah was driven from his throne in 1809, the blind Shah-Zemaun accompanied his flight, and died in exile.

SHAKE, in Music, the alternate and rapid iteration of two sounds which are not less than a semitone, or more than a whole tone, apart. This grace—for as such it is considered—is generally introduced at a pause, and should commence rather slowly, and increase in rapidity as it proceeds, always concluding with a turn. Ex.:



The *sign* of the Shake is a *t* and an *r* conjoined, the two first letters of the Italian *trillo*, or the French *trille*, both signifying the same as the English term.

SHAKERS, a religious sect which arose in the English county of Lancashire about the year 1747. As the individuals of whom it at first consisted had previously been Quakers, they were sometimes called Shaking Quakers, but more commonly Shakers, from the violent shaking of their bodies in their religious exercises. In 1758 they were joined by Ann Lee, a native of Manchester, whose reputation gradually increased, together with the numbers of the sect, till, in 1770, she laid claim to divine inspiration, and called herself Ann the Word. In 1774, in consequence of the persecution to which they were subjected, she and some of her followers set sail from Liverpool for New York, where they arrived in safety. Ann Lee fixed her residence at Watervliet, on the Hudson, not far from Albany. Her labours were very successful in increasing the numbers of the sect. She died at Watervliet in 1784. In 1832 there were 6000 Shakers in the United States, comprised in fifteen 'families,' as their communities are called. The property of each 'family' is held in common; and as the members, who are both males and females, are all single persons, celibacy being strictly enjoined, the numbers can only be kept up by converts. They are generally distinguished for good conduct in the common business of life. They agree with the Quakers in their abhorrence of war, their objection to take oaths, and in the belief of the direct influence of the Holy Spirit; but of their peculiar religious doctrines it is impossible to give any intelligible account. Instead of the original violent shaking, they now move round their hall of worship in a regular and uniform dance to the singing of a hymn, clapping their hands in unison.

SHAKSPERE, WILLIAM.* One of the editors of Shakspere, Steevens,—says, 'All that is known with any degree of certainty concerning Shakspeare is—that he was born at Stratford-upon-Avon—married and had children there—went to London, where he commenced actor, and wrote poems and plays—returned to Stratford, made his will, died, and was buried.' This is not '*all* that is known with any degree of certainty.' There is indeed a lamentable deficiency in the materials for Shakspere's life, such as perhaps exists in no similar instance of a man so eminent amongst his contemporaries. Mr. Hallam has justly observed, 'All that insatiable curiosity and unwearied diligence have detected about Shakspeare serves rather to disappoint and perplex us than to furnish the slightest illustration of his character. It is not the register of his baptism, or the draft of his will, or the orthography of his name, that we seek. No letter of his writing, no record of his conversation, no character of him drawn with any fulness by a contemporary, can be produced.' But if we have nothing but registers, and title-deeds, and pedigrees, and wills, we must be content with these 'spoils of time,' in the absence of matters which bring us nearer to the individual. We have however the possibility left of throwing some light upon the obscurity, by grouping these records, amidst the mass of circumstances of which they form so small a part. We have the 'tombstone information,' as such facts have been called; but we have something more. The life of Shakspere has to us a value above that of all other values in connexion with his writings. Whatever difference of opinion there may be as to the dates of particular works, there is, upon the whole, sufficient evidence to enable us to class those works in cycles. This species of inquiry forms no unimportant part of the biography of Shakspere; and new views may, without impropriety, be based upon the new circumstances connected with the poet's literary history which have been opened to us by diligent inquirers during the last few years.

In the register of baptisms of the parish church of Stratford-upon-Avon we find, under the date of April 26, 1564, the entry of the baptism of William, the son of John Shakspere. The entry is in Latin—'Gulielmus filius Johannes Shakspere.' The date of William Shakspere's birth has always been taken as three days before his baptism; but there is certainly no evidence of this fact. Who was John Shakspere, the father of William? The same register of baptisms shows, it is reasonably conjectured, that *he* had two daughters baptised in previous years—Jone, September 15th, 1558; Margaret, December 2nd, 1562. Another brief entry in another book closes the record of Margaret Shakspere; she was buried on the 30th of April, 1563. There is very little doubt that the elder daughter, Jone, died also in infancy; for another daughter of John Shakspere, also called Jone, was baptised in 1569. William was in all probability the first of the family who lived beyond the period of childhood. From these records, then, we collect, that John Shakspere was married and living in the parish of Stratford in 1558. He was no doubt settled there earlier; for in the archives of the town, by which his course may be traced for some years, we find that he was, in 1556, one of the jury of the court-leet; in 1557, one of the ale-tasters; at Michaelmas of that year, or very soon afterwards, he was elected a burgess or junior member of the corporation; in 1558 and 1559 he served the office of constable, which duty appears then to have been imposed upon the younger members of the corporate body; lastly, in 1561, he was elected one of the chamberlains. Here then, previous to the birth of William Shakspere, we find his father passing through the regular gradations of those municipal offices which were filled by the most respectable inhabitants of a country town. What the occupation of John Shakspere was cannot be very readily determined. Aubrey, the antiquary, who lived till nearly the end of the seventeenth century, and whose manuscripts are preserved in the Bodleian Library at Oxford, says, 'Mr. William Shakespear was born at Stratford-upon-Avon, in the county of Warwick; *his father was a butcher*, and I have been told heretofore by some of the neighbours, that when he was a boy, he exercised his father's trade; but when he killed a calf, he would do it in a high style, and make a speech.' There has been recently published a letter, which was formerly in the possession of the family of Lord de Clifford, written by a member of one of the inns of court, and giving an account of the writer's visit to Warwickshire in 1693. After copying the inscription on the poet's monument, he says, 'The clerk that showed me this church was above eighty years old. He says that this Shakespeare was formerly in this town *bound apprentice to a butcher*, but that he ran from his master to London, and there was received into the playhouse as a servitour, and by this means had an opportunity to be what he afterwards proved. He was the best of his family; but the male line is extinguished.' Aubrey's anecdotes of Shakspere are supposed to have been collected about 1680. The letter-writer from Warwickshire was gratifying his honourable curiosity about him whom he styles 'our English tragedian' in 1693. The parish clerk 'above eighty years old' was probably the informant of both parties. He would have been about three years old when Shakspere died, and the period of Shakspere's apprenticeship which he records would have been some forty years earlier. The accounts, it will be seen, materially differ. Aubrey says, 'His father was a butcher;' the parish clerk, 'He was bound apprentice to a butcher.' To the edition of Shakspere's works published by Rowe in 1709, was prefixed a 'Life.' Rowe acknowledges 'a particular obligation' to Betterton, the celebrated actor, 'for the most considerable part of the passages relating to this life, which I have here transmitted to the public: his veneration for the memory of Shakspeare having engaged him to make a journey into Warwickshire on purpose to gather up what remains he could of a name for which he had so great a veneration.' Betterton, then, thus speaking through Rowe, says, 'He was the son of Mr. John Shakspeare, and was born at Stratford-upon-Avon, in Warwickshire, in April, 1564. His family, as appears by the register and public writings relating to that town, were of good figure and fashion there, and are mentioned as gentlemen. His father, who was a *considerable dealer in wool,*' &c. But Malone, in his posthumous 'Life' of the poet, has published a document which is held to be decisive as to this question. It is a record of proceedings in the Bailiff's Court in 1555, in which some process is shown to have been taken against John Shakyspere, of Stratford, *glover.* Malone has argued that this was a considerable branch of trade, and no doubt it was. But we are by no means certain that John Shakyspere the glover was the same person as the poet's father. There was another John Shakspere living in Stratford, who has been repeatedly mistaken for the more interesting butcher, woolman, or glover; and the mistake, we believe, has gone somewhat farther than has been acknowledged. He was a younger man than the father of our poet, for he married in 1584. He was a shoemaker, as is proved by repeated entries in the books of the corporation. Might not his father have been the glover in 1555? Shakspere appears to have been one of the most common names in the town of Stratford; and we have also, as well as John the shoemaker, Thomas, a butcher. About the same period William Shakspere's father is called *a yeoman* in one of the deeds relating to his property. We believe, as we shall presently show, that he was originally of the rank which is denominated gentleman at the present day; he was subsequently *legally* recognised as a gentleman, in the sense in which the word was used in former days. It was not incompatible with this opinion that he should be either a butcher or a dealer in wool. Whether he possessed any patrimonial property or not, he undoubtedly, by marriage, became the proprietor of an estate. He married, as we shall see, an heiress—a lady of antient family. It was after this marriage that he was designated by some a butcher, by others a dealer in wool. There is a mode of reconciling these contradictory statements which has been overlooked by those who have been anxious to prove that Shakspere was not the son of a butcher. In Harrison's 'Description of England,' we have an exact notice of the state of society at the precise time when John Shakspere, the possessor of landed property, was either a butcher or a woolman, or both. We have here a complaint of the exactions of landlords towards their tenants, particularly in the matter of demanding a premium on leases; and it thus proceeds:—'But most sorrowful of all to understand that men of great port and countenance are so far from suffering their farmers to have any gain at all, that *they themselves become graziers,* BUTCHERS, *tanners,* SHEEPMASTERS, *woodmen, and denique quid non,* thereby to enrich themselves, and bring all the wealth of the country into their own hands, leaving the commonalty weak, or as an idol with broken or feeble arms, which may in a time of peace have a plausible show, but, when necessity shall enforce, have an heavy and bitter sequel.' The term 'gentleman-farmer' was not invented in Harrison's time, or we should, we believe, have a pretty correct description of the occupation of John Shakspere.

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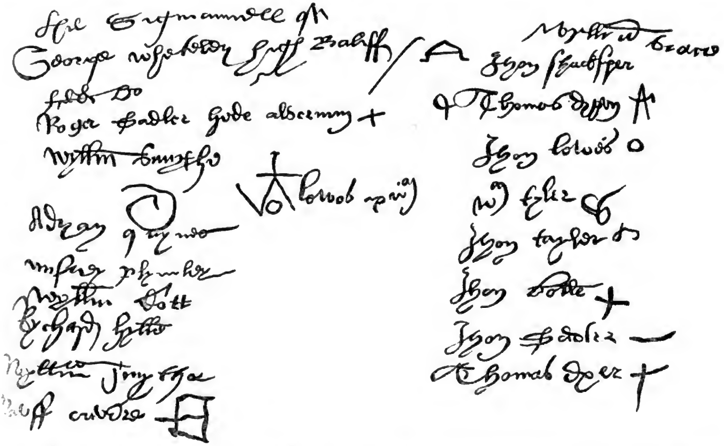
* In the article ENGLISH DRAMA this name has been written as commonly printed—*Shakspeare*. This orthography was adopted by the commentators in the belief that the poet had so *written* his name. This was an error, and acknowledged as such by Malone ('Inquiry,' &c., p. 121). Sir Frederic Madden has shown, in a letter published in the 'Archæologia,' vol. xxvii., that in the acknowledged genuine signatures in existence, 'the poet always wrote his name SHAKSPERE, and, consequently, that those who have inserted an *e* after the *k*, or an *a* in the second syllable, do not write the name (as far as we are able to judge) in the same manner as the poet himself uniformly would authorise us to do.' In the Stratford Register, both at his baptism and burial, says Sir F. Madden, the name is spelt *Shakspere*. We may add that, in the same registers, the entries of the baptism of his three children, and of the burial of his son (which entries were most probably made under his own inspection), are spelt *Shakspere*. The printers however, during his life, and in the folio of 1623, spelt his name Shakespeare.

But we have now to inquire who was the mother of William Shakspere? His father died in 1601. On the 9th of September, 1608, we have an entry in the Stratford register of burial, 'Mary Shakspere, widow.' It is stated in a bill in chancery, of the date of November 24th, 1597, that John Shakspere and Mary his wife were 'lawfully seised in their demesne as of fee as in the right of the said Mary of and in one messuage and one yard land, with the appurtenances, lying and being in Wylnecote.' In the will of Robert Arden, dated November 24th, 1556, we find, 'I give and bequeath to my youngest daughter Mary all my land in Willmecote, called Asbyes, and the crop upon the ground,' &c. We shall presently have occasion more particularly to refer to a grant of arms made to John Shakspere in 1569, and confirmed in 1599. In the latter document it is recited that he 'had married the daughter and one of the heirs of Robert Arden, of Wellingcote.' The grandfather of Mary Arden was groom of the chamber to Henry VII., and he was the nephew of Sir John Arden, squire of the body to the same king. Sir John Arden was a son of Walter Arden, and of Eleanor, the daughter of John Hampden of Buckinghamshire. There were thus the ties of a common blood between William Shakspere and one of the most distinguished men of the next generation—John Hampden, who was a student in the Inner Temple when the poet died. Mary Arden's property has been computed to be worth some hundred and ten pounds of the money of *her* time. It is probable that Mary Arden became the wife of John Shakspere soon after her father's death, which was in 1556.

Of these parents, then, was William Shakspere born, in 1564, in the town of Stratford. In that town there is a street retaining its antient name, Henley-street, being the road to Henley-in-Arden, where, in 1574, stood two houses with a garden and orchard annexed to each; and these houses were then purchased by John Shakspere. It is said that William Shakspere was born in one of these houses. His father may have inhabited the house before the purchase; and it is more than probable that he did, for at a court-leet in 1556 there is an entry of an assignment to him of the lease of a house in Henley-street, and of another in Greenhill-street. There is nothing to prove that the poet was *not* born in the house in Henley-street: and there that house still stands, altered according to modern fashion, its gable roofs destroyed,—divided and subdivided into smaller tenements,—part converted into a little inn, part the residence of a female who shows the room where it is alleged that Shakspere first saw the light, and the low-roofed kitchen where his mother taught him to read. The walls of that bedroom are covered literally with thousands of names, inscribed in homage by pilgrims from every region where the glory of Shakspere is known. At the time when Shakspere's father bought this house, it was, no doubt, a mansion as compared with the majority of houses in Stratford. There is an order from the Privy Council to the bailiff of Stratford, after a great fire which happened there in 1614, pointing out that fires had been very frequently occasioned there 'by means of thatched cottages, stacks of straw, furzes, and such-like combustible stuff, which are suffered to be erected and made confusedly in most of the principal parts of the town without restraint.' Stratford, like nearly every other town of England in that day, closely built, imperfectly drained, was subject to periodical visitations of the plague. From the average annual number of births and burials we may infer that the usual number of the inhabitants was about 1200. When William Shakspere was about two months old, the plague broke out in this town, and, in the short space of six months, 238 persons, a fifth of the population, fell victims. The average annual mortality was about forty. No one of the family of Shakspere appears to have died during this visitation. In 1566 another son, Gilbert, was born. The head of this growing family was actively engaged, no doubt, in private and public duties. In 1568 John Shakspere became the bailiff, or chief magistrate, of Stratford. This office, during the period in which he held it, would confer rank upon him, in an age when the titles and degrees of men were attended to with great exactness. Malone says that, from the year 1569, the entries, either in the corporation-books or the parochial registers, referring to the father of the poet, bear the addition of *master*, and that this honourable distinction was in consequence of his having served the office of bailiff. We doubt this inference exceedingly. John Shakspere would not have acquired a permanent rank by having filled an annual office. But he did acquire that permanent rank in the year 1569, in the only way in which it could be legally acquired. A *grant of arms* was then made to him by Robert Cooke, Clarenceux. The grant itself is lost, but it was confirmed by Dethick, Garter King at Arms, and Camden, in 1599. That confirmation contains the following preamble: 'Being solicited, and by credible report informed, that John Shakspere, now of Stratford-upon-Avon, in the county of Warwick, gent., whose parent and great-grandfather, late antecessor, for his faithful and approved service to the late most prudent prince, King Henry VII., of famous memory, was advanced and rewarded with lands and tenements, given to him in those parts of Warwickshire where they have continued by some descents in good reputation and credit; and for that the said John Shakspere having married the daughter and one of the heirs of Robert Arden of Wellingcote, in the said county, and also produced this his antient coat-of-arms, heretofore assigned to him whilst he was her majesty's officer and bailiff of that town: in consideration of the premises,' &c. Ne-thing, we should imagine, could be clearer than this. John Shakspere produces his antient coat-of-arms, assigned to him whilst he was bailiff of Stratford; and he recites also that he married one of the heirs of Arden of Wellingcote. Garter and Clarencieux, in consequence, allow him to impale the arms of Shakspere with the antient arms of Arden of Wellingcote. The Shakspere arms were actually derived from the family name, and the united arms were used in the seal of William Shakspere's daughter. Yet Malone has a most elaborate argument to prove that the grant of arms was made entirely with reference to the circumstance that John Shakspere had married one of the daughters and heirs of Arden of Wellingcote. Such questions may appear frivolous and unworthy to be discussed in the notice of a man so elevated above the accidents of birth and station. Yet the subject is important in connexion with the education of Shakspere. A great deal of what would appear little less than miraculous in his writings, especially with reference to the almost boundless amount of knowledge which they contain on every subject, will raise in us not a vulgar wonder, but a rational admiration, when we look at him as a well-nurtured child, brought up by parents living in comfort if not in affluence, and trained in those feelings of honour which were more especially held the possession of those of gentle blood. His father and mother were, we have no doubt, educated persons; not indeed familiar with many books, but knowing some thoroughly; cherishing a kindly love of nature and of rural enjoyments amidst the beautiful English scenery by which they were surrounded; admirers and cultivators of music, as all persons above the lowest rank were in those days; frugal and orderly in all their household arrangements; of habitual benevolence and piety.

Malone assures us that Shakspere's father *could not write.* We have taken some pains to examine the evidence which was produced for this assertion. Putting the higher considerations of the poet's education out of the question, we thought it scarcely consistent with his habitual reverence for those things which we are called upon to honour, that he should make his own father the subject of his satire, and that during his father's lifetime, in the praise which Jack Cade bestows upon those who 'do not use to write their names, but have a mark of their own, like honest plain-dealing men.' Malone tells us that John Shakspere had a mark of his own, and it 'nearly resembles a capital A, and was perhaps chosen in honour of the lady whom he had married.' He further says, 'Out of nineteen persons who signed a paper relative to one of their body who had been elected bailiff, ten of whom were aldermen, and the rest burgesses, seven only could write their names; and among the twelve marksmen is found John Shakspere.' The paper to which he refers is an order of a common-hall, dated September 27, 1564.

Malone talks as if John Shakspere's use of a mark was a common thing. There is not another example in the corporation-books in which the name of John Shakspere is attached to any order of a common-hall. Such orders were very rarely signed by members of the corporation who were present, but the entry to which the name of John Shakspere is affixed was a very special one. In this special order, then, of which a fac-simile is before us, there are *two* marks made *near* the name of *John Shacksper*, but *not* affixed to it, which nearly resemble a capital A. The first of these (which is in the first column of names, Shacksper's being in the second) follows the entry of the sign-manual of 'George Whetely, high-bailiff;' and twenty-five years afterwards, we find in the corporation books George Whetely still using precisely the same sign-manual. But there is another mark also *near* the name of John Shacksper. It is not much like an A, but is the exact representation of an open pair of compasses, such as carpenters and bookbinders use, having a quadrant upon which the leg moves. The mason or carpenter, no doubt, used this sign; as another of the corporation drew a very good gridiron. The compasses are *immediately opposite* the name of Thomas Dyxun, above whose mark stands the name of John Shacksper separated by a space large enough for the insertion of a third name. There are twelve marksmen, five of whom bear the name of *John.* All these Johns are written without doubt by the same pen—*Jhon;* but the *Jhon* of our poet's father has a marked difference: in the five the *h* is most distinctly separated from the following letter; in his it is as distinctly connected with it. There are two marksmen whose names begin with a capital S. The *s* beginning the name of Shacksper is entirely different—it cannot be called a capital, being the plain *long s,* the same that is found in the second syllable *sper.* These facts are to be weighed against Malone's assertion.



William Shakspere then, we think, had a mother who could read and a father who could write. They probably could do something more in the way of advancing the intelligence of their son. But, at any rate, when he became old enough, they would send their boy to the endowed grammar-school of the town in which they lived. He probably went there about 1571, when his father had become chief alderman of the town.

The free-school of Stratford was founded in the reign of Henry VI., and received a charter from Edward VI. It was open to all boys, natives of the borough; and, like all the grammar-schools of that age, was under the direction of men who, as graduates of the universities, were qualified to diffuse that sound scholarship which was once the boast of England. We have no *record* of Shakspere having been at this school; but there can be no rational doubt that he was educated there. His father could not have procured for him a better education anywhere. It is perfectly clear to those who have studied his works (without being influenced by prejudices, which have been most carefully cherished, implying that he had received a very narrow education) that they abound with evidences that he must have been solidly grounded in the learning, properly so called, which was taught in grammar-schools. As he did not adopt any one of the learned professions, he probably, like many others who have been forced into busy life, cultivated his early scholarship only so far as he found it practically useful, and had little leisure for unnecessary display. His mind was too large to make a display of anything. But what professed scholar has ever engrafted Latin words upon our vernacular English with more facility and correctness? And what scholar has ever shown a better comprehension of the spirit of antiquity than Shakspere in his Roman plays? The masters of the Stratford school, from 1572 to 1587, were Thomas Hunt and Thomas Jenkins. They are unknown to fame. They were, no doubt, humble and pious men, satisfied with the duties of life that were assigned to them. Hunt was the curate of a neighbouring village, Luddington. It is most probable that they did their duty to Shakspere. At any rate they did not spoil his marvellous intellect.

There are local associations connected with Stratford which could not be without their influence in the formation of Shakspere's mind. Within the range of such a boy's curiosity were the fine old historic towns of Warwick and Coventry, the sumptuous palace of Kenilworth, the grand monastic remains of Evesham. His own Avon abounded with spots of singular beauty, quiet hamlets, solitary woods. Nor was Stratford shut out from the general world, as many country towns are. It was a great highway; and dealers with every variety of merchandise resorted to its fairs. The eyes of Shakspere must always have been open for observation. When he was eleven years old Elizabeth made her celebrated progress to Lord Leicester's castle of Kenilworth; and there he might even have been a witness to some of the 'princely pleasures' of masques and mummeries which were the imperfect utterance of the early drama. At Coventry, too, the antient mysteries and pageants were still exhibited in the streets, the last sounds of those popular exhibitions which, dramatic in their form, were amongst the most tasteless and revolting appeals to the senses. More than all, the players sometimes even came to Stratford. What they played, and with what degree of excellence, we shall presently have occasion to mention.

A belief has obtained that William Shakspere's family, about his fourteenth year, became embarrassed in their circumstances, and subsequently fell into great poverty. The question is not uninteresting, looking at the probable influence of such a state of his father's circumstances upon the future destiny of the great poet. A passage in the poet's 'Life' by Rowe has led to the pains-takings by which this theory has been sought to be established:—'His father, who was a considerable dealer in wool, had so large a family, ten children in all, that, though he was his eldest son, he could give him no better education than his own employment. He had bred him, it is true, for some time at a free-school, where, it is probable, he acquired what Latin he was master of; but the narrowness of his circumstances, and the want of his assistance at home, forced his father to withdraw him from thence, and unhappily prevented his further proficiency in that language. It is without controversy that in his works we scarce find any traces of anything that looks like an imitation of the antients.' Rowe then goes on to assume that because he did not copy from the antients he had never read them; he has given us no facts to prove the narrowness of his father's circumstances. Malone however says there is 'abundant proof' that when our author was about fourteen years old his father was 'by no means in affluent or even easy circumstances.' This may be. He supplies however certain extracts from the Corporation and parochial books to show that John Shakspere was 'in distressed circumstances.' These are, we think, all capable of another interpretation. But there is one entry which would be decisive if it could be proved to apply to the poet's father. In 1586 a return is made into the Bailiff's Court, upon an action for debt, upon which distraint was ordered against John Shakspere; and the return sets forth that he has nothing upon which distress can be levied. This would indeed imply a breaking up of the family, a scattering of all their worldly goods. But Malone, who has taken very laudable pains to show that there was *another* John Shakspere in Stratford, a shoemaker, who married in 1584, and actually received a *loan out of a charity-fund* about that time, does not suggest the possibility that *this* might be the John Shakspere who had no goods to be taken in execution. The return in the Bailiff's Court does not designate the debtor by the alderman's received *title* of *master*, or *magister*. The rise however of our poet's father must have been as rapid as his fall—if he had fallen; for there is a memorandum affixed to the grant of arms in 1596—'he hath lands and tenements, of good wealth and substance, 500*l*.' Malone assumes that this is a fiction of the Heralds' Office. Why cannot we, who read the past thus darkly—who even know so little of the present—be content with what is obvious in private or public history?

Inquiries such as these would be worse than useless, unless they had some distinct bearing on the probable career of William Shakspere. Of the earlier part of that career nothing can, probably, ever be known with certainty. His father added to his independent means, we have no doubt, by combining several occupations in the principal one of looking after a little land; exactly in the way which Harrison has described. Shakspere's youth was, in all probability, one of very desultory employment, which afforded him leisure to make those extraordinary acquisitions of general knowledge which could scarcely have been made, or rather, the foundations of which could not have been established, during the active life which we believe he led from about his twentieth year. It is in this manner, we are inclined to think, that we must reconcile the contradictory traditions of his early employment. As his father, carrying on various occupations connected with his little property, might, after the lapse of years, have been a woolman in the imperfect recollection of some, and a butcher in that of others, so his illustrious son, having no very settled employment, may have been either reputed an assistant to his father, a lawyer's clerk, a schoolmaster, or a wild scapegrace, according to the imperfect chroniclers of a country-town, who, after he returned amongst them a rich man, would rejoice in gossiping over the wondrous doings of the boy. It is thus, we believe, that old Aubrey, having been amongst the parish-clerks and barbers of Stratford some fifty years after Shakspere was dead, tells us, 'from Mr. Beeston'—' though, as Ben Jonson says of him, that he had but little Latin and less Greek, he understood Latin pretty well, for he had been *in his younger years* a schoolmaster in the country.' His precocious gravity as a schoolmaster must have been as wonderful as his poetical power; for Aubrey also tells us, 'this William, being inclined naturally to poetry and acting, came to London, I guess about *eighteen*, and did act exceedingly well. . . . . . . He began *early* to make essays at dramatic poetry, which at that time was very low, and his plays took well.' Here, we think, is a statement not very far from the truth,—a statement derived from Aubrey's London information. The stories of the butcher and the schoolmaster were Stratford traditions, perhaps also with some shadow of reality about them.

The earliest connected narrative of Shakspere's life, that of Rowe, thus briefly continues the history of the boy:—'Upon his leaving school he seems to have given entirely into that way of living which his father proposed to him; and in order to settle in the world after a family manner, he thought fit to marry while he was yet very young. His wife was the daughter of one Hathaway, said to have been a substantial yeoman in the neighbourhood of Stratford.' The information which Betterton thus collected as to Shakspere's early marriage was perfectly accurate. He did marry 'the daughter of one Hathaway,' and he was no doubt 'a substantial yeoman in the neighbourhood of Stratford.' At Shottery, a pretty village within a mile of the town, there is yet a farm-house, now divided into two tenements, where it is affirmed that Hathaway dwelt. By a copy of Court Roll, of the date of 1543, it appears that John Hathaway then held a copyhold estate at Shottery. The identical farm-house or cottage, with its little garden and orchard, remained in the possession of the descendants of the Hathaways till 1838: it was then sold. William Shakspere was married to Anne Hathaway before the close of the year 1582. He was then eighteen years and a half old. This was indeed an early marriage. His wife was considerably older than himself. Her tombstone states that she died 'on the 6th day of August, 1623, being of the age of sixty-seven years.' In 1623 Shakspere would have been fifty-nine years old. The marriage bond and licence were discovered amongst the papers of the Consistorial Court at Worcester, in 1836: and were published, by Mr. Wheler of Stratford, in the 'Gentleman's Magazine.' The bondsmen are, Fulk Sandells, of Stratford, farmer, and John Richardson, of the same place, farmer, and they are held and bound in the sum of 40*l.*, &c. This bond is dated the 28th of November, in the 25th year of Elizabeth—that is, in 1582. The bondsmen subscribe their marks. The licence is affixed to the bond, and the remarkable part of this document is, that they were to be married 'with *once* asking of the bans;' they were not to be married 'without the consent' of Anne's friends. There is no record where they were married. In 1583 an entry of the baptism of 'Susanna, daughter to William Shakspere' is found in the Stratford register. The entry is the fourth of the month, the word *May* being attached to the first entry of the month. A comparison of the dates of the marriage licence and the baptism of Shakspere's first child leads to the obvious conclusion that the same fault into which the courtly Raleigh and the high-born Elizabeth Throgmorton had fallen had disturbed the peace of the humble family of the Hathaways, and had no doubt made the mother of the imprudent boy-poet weep bitter tears. But there was instant reparation—a reparation, too, that must have been the voluntary act of him who had committed the error. The troth-plight had no doubt preceded the legal marriage. There was however no public shame. William Shakspere was an inhabitant of Stratford, and his wife is denoted as such in the licence;—and there they dwelt when they were married;—and there their children were born;—and there they lived in their later years in opulence;—and there they died. We can see no useful purpose to be served in drawing inferences unfavourable to the general character of Shakspere's wife from the document which has been discovered, and especially in assuming that domestic unhappiness banished him from Stratford. Early in 1585 twin children were born to him,—and they were baptized on the 2nd of February as 'Hamnet and Judeth.'

The cause which *drove* Shakspere from Stratford is thus stated by Rowe:—'He had, by a misfortune common enough to young fellows, fallen into ill company, and, amongst them, some that made a frequent practice of deer-stealing engaged him more than once in robbing a park that belonged to Sir Thomas Lucy, of Charlecote, near Stratford. For this he was prosecuted by that gentleman, as he thought, somewhat too severely; and in order to revenge that ill usage he made a ballad upon him. And though this, probably the first essay of his poetry, be lost, yet it is said to have been so very bitter, that it redoubled the prosecution against him to that degree that he was obliged to leave his business and family in Warwickshire for some time, and shelter himself in London.' All this, amongst a great deal of falsehood, probably contained some tissue of the truth—such as the truth appeared to the good old folks of Stratford in Betterton's time, who had heard stories from their grandfathers of what a wild young fellow the rich man was who bought the largest house in Stratford. Malone gravely undertakes to get rid of the deer-stealing tradition, by telling us that there was no *park*, properly so called, at Charlecote. It is more material that the statute of the 5th of Elizabeth, which Malone also recites, shows clearly enough that the hunting, killing, or driving out deer from any park was a trespass punished at the most with three months' imprisonment and treble damages. Sir Thomas Lucy, who was on terms of intimacy with the respectable inhabitants of Stratford, acting as arbitrator in their disputes, was not very likely to have punished the son of an alderman of that town with any extraordinary severity, even if his deer had been taken away. To kill a buck was then an offence not quite so formidable as the shooting of a partridge in our own times. But we may judge of the value of the tradition from some papers, originally the manuscripts of Mr. Fulman, an antiquary of the seventeenth century, which, with additions of his own, were given to Corpus Christi College, Oxford, on the decease of the Rev. Richard Davies, rector of Sandford, Oxfordshire, in 1707. The gossip of Stratford had no doubt travelled to the worthy rector's locality, and rare gossip it is:—'*He* (Shakspere) was much given to all unluckiness, in stealing venison *and rabbits*, particularly from Sir Lucy, *who had him* OFT *whipt*, and SOMETIMES *imprisoned*, and at last made him fly his native country, to his great advancement. But his revenge was so great that he is his Justice *Clodpate;* and calls him a great man, and that, in allusion to his name, bore three *louses* rampant for his arms.' Is it necessary to do more than recite such legends to furnish the best answer to them?

Although John Shakspere, at the time of his son's early marriage, was not, as we think, 'in distressed circumstances,' his means were not such probably, at any time, as to have allowed him to have borne the charge of his son's family. That William Shakspere maintained them by some honourable course of industry we cannot doubt. Scrivener or schoolmaster, he was employed. It is on every account to be believed that the altered circumstances in which he had placed himself, in connection with the natural ambition which a young man, a husband and a father, would entertain, led him to London not very long after his marriage. There, it is said, the author of 'Venus and Adonis' obtained a subsistence after the following ingenious fashion:—'Many came on horseback to the play, and when Shakspere fled to London from the terror of a criminal prosecution, his first expedient was to wait at the door of the playhouse, and hold the horses of those who had no servants, that they might be ready again after the performance. In this office he became so conspicuous for his care and readiness, that in a short time every man as he alighted called for Will Shakspeare, and scarcely any other waiter was trusted with a horse while Will Shakspeare could be had.' Steevens objects to this surpassing anecdote of the horse-holding, that the practice of *riding* to the playhouse never began, and was never continued, and that Shakspere could not have held horses at the playhouse-door because people went thither by water. We believe there is a stronger objection still: until *Will Shakspere* converted the English drama from a rude, tasteless, semi-barbarous entertainment, into a high intellectual feast for men of education and refinement, those who kept horses did not go to the public theatres at all. There were representations in the private houses of the great, which men of some wit and scholarship wrote, with a most tiresome profusion of unmeaning words, pointless incidents, and vague characterization,—and these were called plays; and there were 'storial shows' in the public theatres, to which the coarsest melo-drama that is now exhibited at Bartholomew Fair would be as superior as Shakspere is superior to the highest among his contemporaries. But from 1580 to 1585, when Shakspere and Shakspere's boys are described as holding horses at the playhouse-door, it may be affirmed that the English *drama*, such as we now understand by the term, had to be created. We believe that Shakspere was in the most eminent degree its creator. He had, as we think, written his 'Venus and Adonis,' perhaps in a fragmentary shape, before he left Stratford. It was first printed in 1593, and is dedicated to Lord Southampton. The dedication is one of the few examples of Shakspere mentioning a word of himself or his works:—'I know not how I shall offend in dedicating my unpolished lines to your lordship, nor how the world will censure me for choosing so strong a prop to support so weak a burden; only if your honour seem but pleased, I account myself highly praised, and vow to take advantage of all idle hours till I have honoured you with some graver labour. But if the first heir of my invention prove deformed, I shall be sorry it had so noble a godfather, and never after ear so barren a land, for fear it yield me still so bad a harvest. I leave it to your honourable survey, and your honour to your heart's content, which I wish may always answer your own wish and the world's hopeful expectation.' The dedication is simple and manly. In 1593 then Shakspere had an employment—a recognised one—for he speaks of 'idle hours' to be devoted to poetry. He calls this poem too 'the first heir of my invention.' If it 'prove deformed,' he will never after ear (plough) so barren a land.' Will he give up writing for the stage then? It is a remarkable proof of the low reputation of the drama that even the dramatic works which Shakspere had unquestionably produced in 1593 were not here alluded to. The drama scarcely then aspired to the character of poetry. The 'some graver labour' which he contemplated was another *poem*; and he did produce another the next year, which he also dedicated to the same friend. This was the 'Rape of Lucrece.' Perhaps these poems were published to vindicate his reputation as a writer against the jealousies of some of the contemporary dramatists. But we still think that he used the term 'first heir of my invention' in its literal sense; and that 'Venus and Adonis'—or at least a sketch of it—was the first production of his imagination, his invention. It bears every mark of a youthful composition; it would have been more easily produced by the Shakspere of eighteen or twenty than any of his earliest dramas. He had models of such writing as the 'Venus and Adonis' before him. Chaucer he must have diligently studied; Spenser had published his 'Shepherd's Calendar,' his Hymns to Love and Beauty, and other poems, when Shakspere's genius was budding amidst his native fields. But when he wrote 'Henry VI.' or the first 'Hamlet,' where could he seek for models of dramatic blank verse, of natural dialogue, of strong and consistent character? He had to work without models; and this was the real 'graver labour' of his early manhood. It has been discovered by Mr. Collier that in 1589, when Shakspere was only twenty-five, he was a joint proprietor in the Blackfriars theatre, with a fourth of the other proprietors below him in the list. He had, at twenty-five, a standing in society; he had the means, without doubt, of maintaining his family; as he advanced in the proprietorship of the same theatre, he realized a fortune. How had he been principally occupied from the time he left Stratford, to have become somewhat rapidly a person of importance amongst his 'friends and fellows?' We think, by making himself useful to them, beyond all comparison with others, by his writings. It appears to us not improbable that even before Shakspere left Stratford, he had attempted some play or plays which had become known to the London players. Thomas Greene, who in 1586 was the fourth on the list of the Blackfriars shareholders, was said to be Shakspere's fellow townsman. But the young poet might have found another and more important friend in the Blackfriars company:—Richard Burbage, the great actor, who in his own day was called 'the English Roscius,' was also of Shakspere's county. In a letter of Lord Southampton to the Lord Chancellor Ellesmere (written about 1608), introducing Burbage and Shakspere to the chancellor, it is said:—'They are both of one county, and indeed almost of one town.' It is perfectly clear therefore that Shakspere, from the easy access that he might have procured to these men, would have received inviting offers to join them in London, provided he had manifested any ability which would be useful to them. That ability, we have no doubt, was manifested by the production of original plays (as well as by acting) some time before he had attained the rank and profit of a shareholder in the Blackfriars company.

The theory that Shakspere had not produced any of his dramas till several years after he was a shareholder in the Blackfriars theatre, is generally upheld by the assertion that he is not noticed by any contemporary writer till after the period usually assigned to the commencement of his career as a dramatic author; that is, about 1592. There is an allusion to 'Hamlet' by Nashe, in 1589; and the most reasonable belief is, that this was Shakspere's Hamlet—an earlier sketch than the early one which exists. We believe with Dryden and Rowe, that a remarkable passage in Spenser's 'Thalia' applies to Shakspere (*Store of Knowledge*, No. 2), and that poem was published in 1591. The application of these passages to Shakspere is strongly disputed by those who assign the first of his plays to 1593. In an age when there were no newspapers and no reviews, it must be extremely difficult to trace the course of any man, however eminent, by the notices of the writers of his times. An author's fame then was not borne through every quarter of the land in the very hour in which it was won. More than all, the reputation of a dramatic writer could scarcely be known, except to a resident in London, until his works were committed to the press. The first play of Shakspere's which was printed was 'The First Part of the Contention' ('Henry VI.,' Part II.), and that did not appear till 1594. Now Malone says, 'In Webbe's 'Discourse of English Poetry,' published in 1586, we meet with the name of most of the celebrated poets of that time; particularly those of George Whetstone and Anthony Munday, who were dramatic writers; but we find no trace of our author, or any of his works.' But Malone does not tell us that in Webbe's 'Discourse of Poetry' we meet with the following passage — 'I am humbly to desire pardon of the learned company of gentlemen scholars, and students of the universities and inns of court, if I omit their several commendations in this place, which I know a great number of them have worthily deserved, in many rare devices and singular inventions of poetry; for neither hath it been my good hap to have seen all which I have heard of, neither is my abiding in such place where I can with facility get knowledge of their works.' 'Three years afterwards,' continues Malone, 'Puttenham printed his 'Art of English Poesy;' and in that work also we look in vain for the name of Shakspere.' The book speaks of the one-and-thirty years' space of Elizabeth's reign; and thus puts the date of the writing a year earlier than the printing. But we here look in vain for some other illustrious names besides those of Shakspere. Malone has not told us that not one of Shakspere's early dramatic contemporaries is mentioned—neither Marlowe, nor Greene, nor Peele, nor Kyd, nor Lyly. The author evidently derives his knowledge of 'poets and poesy' from a much earlier period than that in which he publishes. He does not mention Spenser by *name*, but he does 'that other gentleman who wrote the late 'Shepherd's Calendar.' The 'Shepherd's Calendar' of Spenser was published in the year 1579. Malone goes on to argue that the omission of Shakspere's name, or any other notice of his works, in Sir John Harrington's 'Apology of Poetry,' printed in 1591, in which he takes occasion to speak of the theatre, and mentions some of the celebrated dramas of that time,' is a proof that none of Shakspere's dramatic compositions had then appeared. Does he mention 'Tamburlaine,' or 'Faustus,' or 'The Massacre of Paris,' or 'The Jew of Malta'? As he does not, it may be assumed with equal justice that none of Marlowe's compositions had appeared in 1591; and yet we know that he died in 1593. So of Lyly's 'Galathea,' 'Alexander and Campaspe,' 'Endymion,' &c. So of Greene's 'Orlando Furioso,' 'Friar Bacon,' 'James IV.' So of the 'Spanish Tragedy' of Kyd. The truth is, that Harrington, in his notice of celebrated dramas was even more antiquated than Puttenham; and his evidence therefore in this matter is utterly worthless. But Malone has given his crowning proof that Shakspere had not written before 1591, in the following words:—'Sir Philip Sidney, in his 'Defence of Poesie,' speaks at some length of the low state of dramatic literature at the time he composed his treatise, but has not the slightest allusion to Shakspere, whose plays, had they then appeared, would doubtless have rescued the English stage from the contempt which is thrown upon it by the accomplished writer; and to which it was justly exposed by the wretched compositions of those who preceded our poet. 'The Defence of Poesie' was not published till 1595, but must have been written some years before.' There is one slight objection to this argument: Sir Philip Sidney was killed at the battle of Zutphen, in the year 1586; and it would really have been somewhat surprising if the illustrious author of the 'Defence of Poesy' could have included Shakspere in his account 'of the low state of dramatic literature at the time he composed this treatise.'

If the instances of the mention of Shakspere by his contemporaries during his lifetime be not numerous, we are compensated by the fulness and explicitness of one notice—that of Francis Meres, in 1598. Short as his notice is, it is by far the most valuable contribution which we possess towards the 'Life' of Shakspere. Meres was a master of arts of Cambridge, and subsequently entered the church. In 1598 he published a book called '*Palladis Tamia*, Wit's Treasury.' It is a collection of moral sentences from antient writers, and it is described by Anthony Wood as 'a noted school-book.' Prefixed to it is 'A Comparative Discourse of our English Poets.' Nothing can be more decisive than this 'Comparative Discourse' as to the rank which, in 1598, Shakspere had taken amongst the most eminent of his contemporaries.

'As the Greek tongue is made famous and eloquent by Homer, Hesiod, Euripides, Æschylus, Sophocles, Pindarus, Phocylides, and Aristophanes; and the Latin tongue by Virgil, Ovid, Horace, Silius Italicus, Lucanus, Lucretius, Ausonius, and Claudianus; so the English tongue is mightily enriched, and gorgeously invested in rare ornaments and resplendent habiliments, by Sir Philip Sidney, Spenser, Daniel, Drayton, Warner, Shakespeare, Marlow, and Chapman.

'As the soul of Euphorbus was thought to live in Pytha goras, so the sweet witty soul of Ovid lives in mellifluous and honey-tongued Shakespeare; witness his 'Venus and Adonis,' his 'Lucrece,' his sugared sonnets among his private friends, &c.

'As Plautus and Seneca are accounted the best for comedy and tragedy among the Latins, so Shakespeare, among the English, is the most excellent in both kinds for the stage; for comedy, witness his "Gentlemen of Verona," his "Errors," his "Love Labours Lost," his "Love Labours Won," his "Midsummer's Night Dream," and his "Merchant of Venice;" for tragedy, his "Richard II." "Richard III.," "Henry IV.," "King John," "Titus Andronicus," and his "Romeo and Juliet."

'As Epius Stolo said that the Muses would speak with Plautus's tongue, if they would speak Latin; so I say that the Muses would speak with Shakespeare's fine filed phrase if they would speak English.'

The list of Shakspere's plays which Meres gives in 1598 can scarcely be supposed to be a complete one. Previous to 1598 there had been only *printed* the two Parts of the 'Contention' (now known as the 'Second and Third Parts of Henry VI.') 'Richard III.,' 'Richard II.,' and 'Romeo and Juliet.' Of the six comedies mentioned by Meres, not one had been published; neither had 'Henry IV.,' 'King John,' nor 'Titus Andronicus;' but, in 1597, 'Love's Labour's Lost,' and the 'First Part of Henry IV.,' had been entered in Stationers' Hall. Without the list of Meres therefore we could not have absolutely shown that the 'Two Gentlemen of Verona,' the 'Comedy of Errors,' the 'All's Well that Ends Well' (which we have every reason to think was designated as 'Love Labours Won') the 'Midsummer Night's Dream,' the 'Merchant of Venice,' the 'King John,' and the 'Titus Andronicus,' were written and produced before 1598. The list of Meres omits the original 'Hamlet' and the 'Taming of the Shrew,' which we may believe were produced before 1598; but, looking at Meres' list alone, how gloriously had Shakspere earned that reputation which he had thus acquired in 1598! He was then thirty-four years of age, but he had produced all his great historical plays, with the exception of 'Henry V.' and 'Henry VIII.' He had given us 'Romeo and Juliet,' and had even 'corrected and augmented' it; the stage was in possession, and the fame acknowledged, of six of his most delicious comedies. Before the close of that century we have little doubt that he had also produced 'Henry V.,' 'The Merry Wives of Windsor,' and 'Much Ado about Nothing.'

Of the plays thus produced before the close of the sixteenth century, we would assign several (not fewer than nine, including the doubtful plays) to the period from Shakspere's early manhood to 1591. Some of those dramas may possibly then have been created in an imperfect state, very different from that in which we have received them. If the 'Titus Andronicus' and 'Pericles' are Shakspere's, they belong to this epoch in their first state, whatever it might have been. We have no doubt that the three plays, in their original form, which we now call the three Parts of 'Henry VI.,' were his; and they also belong to this epoch. That 'Hamlet,' in a very imperfect state, probably more imperfect even than the sketch in the possession of the duke of Devonshire, is the play alluded to by Nashe in 1589, we have little doubt. In the duke of Devonshire's copy, dated 1602, there are passages, afterwards omitted, which decidedly refer to an early state of the stage. Amongst the comedies, 'The Two Gentlemen of Verona,' 'Love's Labour's Lost,' 'The Comedy of Errors,' and 'The Taming of the Shrew,' contain very strong external evidence, especially in the structure of their versification, that they belong to the poet's earliest period. When the time arrived that he had fully dedicated himself to the great work of his life, he rarely ventured upon cultivating the offshoots of his early versification. The doggerel was entirely rejected —the alternate rhymes no longer tempted him by their music to introduce a measure which is scarcely akin with the dramatic spirit—the couplet was adopted more and more sparingly—and he finally adheres to the blank verse which he may almost be said to have created—in his hands certainly the grandest as well the sweetest form in which the highest thoughts were ever unfolded to listening humanity. We have only one drama to add to this cycle, and that, we believe, was 'Romeo and Juliet' in its original form.

The 'Midsummer Night's Dream' may be taken, we apprehend, as a connecting link between the dramas which belong to the first cycle and those which may be assigned to the remaining years of the sixteenth century.

We have little difficulty in determining the plays which belong to Shakspere's *middle* period. The list of Meres, and the dates of the original editions of those plays, are our best guides. The exact years in which they first appeared can only be determined in one or two cases; and it is of little consequence if they could be determined. The earliest of the historical plays of this cycle were those which completed the great story of the wars of the Roses. 'Richard III.' naturally terminated the eventful history of the house of York; 'Richard II.' commenced the more magnificent exhibition of the fortunes of the house of Lancaster. Both these plays were printed in 1597. The two great historical plays of 'Henry IV.' which succeeded them were, no doubt, produced before 1599. 'Henry V.' undoubtedly belongs to that year; and this great song of national triumph grew out of the earlier history of the 'mad-cap Prince of Wales.' The three latter histories are most remarkable for the exhibition of the greatest comic power that the world has ever seen. When the genius of Shakspere produced Falstaff, its most distinguishing characteristics, his wit and humour, had attained their extremest perfection. There is much of the same high comedy in 'King John.' This was the period which also produced those comic dramas which are most distinguished for their brilliancy of dialogue—the 'fine filed phrase' which Meres describes—'The Merry Wives of Windsor,' 'Much Ado about Nothing,' and 'Twelfth Night.' The 'Merchant of Venice,' and 'All's Well that Ends Well,' belong to the more romantic class. The 'Twelfth Night' was originally thought to have been one of Shakspere's latest plays; but it is now proved, beyond a doubt, that it was acted in the Middle Temple Hall in the Christmas of 1601.

The close of the sixteenth century brings us to Shakspere's thirty-fifth year. He had then been about fifteen years in London. We are not willing to believe that his whole time was passed in the capital. It is not necessary to believe it; for the evidence, such as it is, partly gossip and partly documentary, makes for the contrary opinion. Aubrey tells us 'the humour of the constable in 'A Midsummer Night's Dream' he happened to take at Grendon in Bucks, which is the road from London to Stratford, and there was living that constable about 1642, when I first came to Oxon.' The honest antiquary makes a slight mistake here. There is no constable in 'A Midsummer Night's Dream;' but he probably refers to the ever-famous Dogberry or Verges. In the same paper Aubrey says, 'he was wont to go to his native country once a year.'

But we have more trustworthy evidence than that of John Aubrey for believing that Shakspere, however indispensable a protracted residence in London might be to his interests and those of his family, never cast aside the link which bound him to his native town. In 1596 his only son died, and in Stratford he was buried. The parochial register gives us the melancholy record of this loss. This event, afflicting as it must have been, did not render the great poet's native town less dear to him. There his father and mother, there his wife and daughters, there his sister still lived. In 1597 he purchased the principal house in Stratford. It was built by Sir Hugh Clopton, in the reign of Henry VII., and was devised by him under the name of *the great house*. Dugdale describes it as 'a fair house built of brick and timber.' It appears to have been sold out of the Clopton family before it was purchased by Shakspere. In the poet's will it is described as 'all that capital messuage or tenement, with the appurtenances, in Stratford aforesaid, called the New Place.' The London residence of Shakspere at this period is stated to have been in Southwark, near the Bear Garden. It is now incontestably proved that in the year previous to 1596 Shakspere held a much more important rank as a sharer in the Blackfriars Theatre than in 1589; and that the Globe Theatre also belonged to the body of proprietors of which he was one. A petition to the privy council, presented in 1596, was found in the State Paper Office a few years ago, in which the names of the petitioners stand as follows:—

'The humble petition of Thomas Pope, Richard Burbage, John Hemmings, Augustine Phillips, William Shakespeare, William Kempe, William Sly, Nicholas Tooley, and others, servants to the Right Honourable the Lord Chamberlain to her Majesty.'

There is a tradition that the valuable estate of New Place was purchased by Shakspere through the munificent assistance of Lord Southampton. It is pleasant to believe such a tradition; but it is not necessary to account for Shakspere's property in the theatres, or even for his purchase of New Place at Stratford, that we should imagine that some extraordinary prodigality of bounty had been lavished on him. He obtained his property in the theatre by his honest labours, steadily exerted, though with unequalled facility, from his earliest manhood. The profits which he received not only enabled him to maintain his family, but to create an estate; and his was not a solitary case. Edward Alleyn, who was a contemporary of Shakspere, a player and a theatrical proprietor, realized a fortune; and he founded Dulwich College.

It has been held, especially by the German critics, that the Sonnets of Shakspere have not been sufficiently regarded as a store of materials for his biography; and it has been very ingeniously attempted by a recent writer, Mr. Brown, to show that the whole of these, with a few slight exceptions, are to be taken as a continuous poem or poems. He calls them Shakspere's 'Autobiographical Poems.' But we would ask, can these one hundred and fifty-four Sonnets be received as a continuous poem upon any other principle than that the author had written them continuously? If there are some parts which are acknowledged interpolations, may there not be other parts that are open to the same belief? If there are parts entirely different in their tone from the bulk of these Sonnets, may we not consider that one portion was meant to be artificial and another real,—that the poet sometimes spoke in an assumed character, sometimes in a natural one? This theory we know could not hold if the poet had himself arranged the sequence of these verses; but as it is manifest that two stanzas have been introduced from a poem printed ten years earlier—that others are acknowledged to be out of order—and others positively dragged in without the slightest connection—may we not carry the separation still further, and believing that the 'begetter' (by which name some W. H. is honoured by the bookseller in a dedication)—the *getter up*—of these Sonnets had levied contributions upon all Shakspere's 'private friends'—assume that he was indifferent to any arrangement which might make each portion of the poem tell its own history? We do not therefore take up these poems to 'seize a clue which innumerable passages give us, and suppose that they allude to a youth of high rank as well personal beauty and accomplishment, in whose favour and intimacy, according to the base prejudices of the world, a player and a poet, though he were the author of 'Macbeth,' might be thought honoured;' and we do not feel 'the strangeness of Shakspeare's humiliation in addressing him as a being before whose feet he crouched—whose frown he feared—whose injuries, and those of the most insulting kind, he felt and bewailed without resenting.' (Hallam's *Hist. of Europe.*)

The view which we take of the probable admixture of the artificial and the real in the Sonnets, arising from their supposed original fragmentary state, necessarily leads to the belief that some are accurate illustrations of the poet's situation and feelings. It is collected from these Sonnets, for example, that his profession as a player was disagreeable to him; and this complaint, be it observed, might be addressed to any one of his family, or some honoured friend, such as Lord Southampton, as well as to the principal object of so many of those lyrics which contain a 'leading idea, with variations:'—

> 'O, for my sake do you with Fortune chide,
> The guilty goddess of my harmful deeds,
> That did not better for my life provide
> Than public means, which public manners breeds.
> Thence comes it that my name receives a brand,
> And almost thence my nature is subdued
> To what it works in, like the dyer's hand.'

But if from his professional occupation his nature was felt by him to be subdued to what it worked in,—if thence his name received a brand,—if vulgar scandal sometimes assailed him,—he had high thoughts to console him, such as were never before imparted to mortal. This was probably written in some period of dejection, when his heart was ill at ease, and he looked upon the world with a slight tinge of indifference, if not of dislike. Every man of high genius has felt something of this. It was reserved for the highest to throw it off, 'like dew-drops from the lion's mane.' After a very full consideration of Shakspere's *dramatic* works, we are come to the conclusion that he possessed, above all other men, so complete a mastery over the tendency to colour general representations of life and character with personal views and circumstances, that he invariably went out of himself,—that he saw nothing through his own individual feelings,—and that thus none of his portraits are alike, because none are personifications of his own nature—his own life—his own self-consciousness. If there are some portions of his Sonnets which are conceived in an entirely different spirit, we think they are not very numerous, and must be received as evidences of personal character, habits, and feelings with great scrupulousness.

Shakspere during the last year or two of the sixteenth century, and the opening years of the seventeenth, was for the most part in London. In 1598 we find his townsman, Richard Quiney, writing him a letter, requesting the loan of thirty pounds. Mr. Alderman Sturley, with reference to some public business of that period, not only says in a letter that 'our countryman, Mr. William Shakspere, would procure us money,' but speaks 'of the friends *he* can make.' Such notices are decisive as to the position Shakspere then held in the estimation of the world. In 1601 his father died; and his burial is registered at Stratford. He appears then to have had three brothers living,—Gilbert, Richard, and Edmund. Gilbert, the next to himself, resided at Stratford, and probably managed William's affairs there while he was in London; for in 1602, when the prosperous poet bought a considerable quantity of land near Stratford, of William and John Combe (*107 acres*), the counterpart of the conveyance (which we have *seen*) contains an acknowledgment of possession being given to Gilbert Shakspere, to the use of William. It is probable that Gilbert died before William; for no mention is made of him in the poet's will. The younger son of the family, Edmund, born in 1580, followed the fortunes of his illustrious brother. It was probably intended that he should succeed him in his proprietorship of the theatres; but the register of the burials of St. Mary Overies, in Southwark, closes his history in 1607: 'Edmund Shakspere, player, in the church.' Richard Shakspere died in 1613.

In 1603 James I. ascended the throne of England. Lord Southampton, who had so imprudently participated in the conspiracy of Essex, was a favourite of the new king; and one almost of the first acts of the reign was a grant of a patent to the proprietors of the Blackfriars and Globe Theatres. In this patent the name of Shakspere stands the second; the names mentioned being 'Lawrence Fletcher, William Shakspere, Richard Burbage, Augustine Phillips, John Hemmings, Henry Condell, William Sly, Robert Armyn, Richard Cowley.'

It would appear that at this period Shakspere was desirous of retiring from the more laborious duties of his profession as an actor. He desired to be appointed, there is little doubt, to the office of Master of the Queen's Revels. Daniel, a brother poet, was appointed; and in a letter to the Lord Keeper, Sir Thomas Egerton, he thus speaks of one of the competitors for the office:—'It seemeth to my humble judgment that one who is the author of plays now daily presented on the public stages of London, and the possessor of no small gains, and moreover himself an actor in the King's company of comedians, could not with reason pretend to be master of the Queen's Majesty's revels, forasmuch as he would sometimes be asked to approve and allow of his own writings.'

But Shakspere continued to hold his property in the theatre. In 1608 the Corporation of London again attempted to interfere with the actors of the Blackfriars; and there being little chance of ejecting them despotically, a negociation was set on foot for the purchase of their property. A document found by Mr. Collier amongst the Egerton papers at once determines Shakspere's position in regard to the theatrical proprietorship. It is a valuation, containing the following item:—

'Item. W. Shakespeare asketh for the wardrobe
and properties of the same playhouse 500*l.*,
and for his four shares, the same as his fellows
Burbidge and Fletcher, viz. 933*l.* 6*s.* 8*d.* . 1433 6 8'

With this document was found another—unquestionably the most interesting paper ever published relating to Shakspere: it is a letter from Lord Southampton to Lord Ellesmere, the lord chancellor; and it contains the following passage:—

'These bearers are two of the chief of the company; one of them by name Richard Burbidge, who humbly sueth for your Lordship's kind help, for that he is a man famous as our English Roscius, one who fitteth the action to the word and the word to the action most admirably. By the exercise of his quality, industry, and good behaviour, he hath become possessed of the Black Friars playhouse, which hath been employed for plays since it was built by his father, now near fifty years ago. The other is a man no whit less deserving favour, and my especial friend, till of late an actor of good account in the company, now a sharer in the same, and writer of some of our best English plays, which, as your Lordship knoweth, were most singularly liked of Queen Elizabeth, when the company was called upon to perform before her Majesty at court, at Christmas and Shrovetide. His most gracious Majesty King James also, since his coming to the crown, hath extended his royal favour to the company in divers ways and at sundry times. This other hath to name William Shakespeare, and they are both of one county, and indeed almost of one town: both are right famous in their qualities, though it longeth not to your Lordship's gravity and wisdom to resort unto the places where they are wont to delight the public ear. Their trust and suit now is, not to be molested in their way of life whereby they maintain themselves and their wives and families (being both married and of good reputation), as well as the widows and orphans of some of their dead fellows.'

The mode in which Southampton speaks of Shakspere is most noble; it is almost more than could have been expected from a courtier addressing a minister of state. Whatever Southampton might feel towards Shakspere in private, it was something like a breaking down of aristocratic distinctions thus to write of a 'poor player:'—'The other is a man no whit less deserving favour, and *my especial friend.*' Who can doubt the estimation in which Shakspere must have been held by all men when his personal character, as well as his surpassing genius, had thus broken down the observance of the distinctions which in those days were most rigidly clung to? We learn from this letter that in 1608 Shakspere had ceased to be an actor; but he was still a sharer in the company.

We may now suppose that the great poet, thus honoured and esteemed, had retired to Stratford, retaining a property in the theatre—regularly writing for it. There is an opinion that he ceased to act after 1603. In that year his name is found amongst the performers of one of Ben Jonson's plays. But the years from 1604 to his death, in the April of 1616, were not idly spent. He was a practical farmer, we have little doubt. In 1605 he bought a moiety of the tithes of Stratford, which he would then probably collect in kind. He occupied the best house of the place; he had there his 'curious knotted garden' to amuse him; and his orchard had many a pippin of his 'own graffing.' James I. recommended the cultivation of mulberry-trees in England; and who has not heard of Shakspere's mulberry-tree? Vulgar tradition at this time represents him as writing a bitter epitaph upon his friend and neighbour John Combe, as he had satirised Sir Thomas Lucy. He was doing something better. To the first half of the period between 1604 and his death may be assigned—'Lear,' 'Macbeth,' 'Cymbeline,' 'The Winter's Tale,' and 'The Tempest.' The very recital of the names of these glorious works, associated as they are with that quiet country town, its beautiful Avon, its meadows, and its woodlands, is enough to make Stratford a name dear and venerable in every age. But there are others to be added to the wondrous list; and these probably belong to the latter half of the period:—'Troilus and Cressida,' 'Henry VIII.,' 'Coriolanus,' 'Julius Cæsar,' 'Antony and Cleopatra.' The direction of Shakspere's mind to Roman subjects, in his closing period, and the marvellous accuracy, the real substantial learning, with which he has treated them, would lead us to believe that he had renewed the studies of his boyhood in the last years of his retirement. Alfieri learned Greek after he was fifty. It is our opinion that Shakspere continued to write till he was removed by death; and that the Roman plays were the beginning of a series. Who will finish that series?

In 1607 Susanna, the eldest daughter of Shakspere, married a physician resident at Stratford—a man of high professional eminence—Dr. Hall. In 1608 his grand-daughter Elizabeth was born. To this child he bequeathed a sum of money, and all his plate, 'except my broad silver and gilt bowl.' Shakspere was a grandfather at forty-three. In 1608 his mother died—the mother, doubtless, of his ardent love. There is a curious record of Shakspere's later years, which was recently discovered in the library of the Medical Society of London, contained in the 'Diary of the Rev. John Ward, Vicar of Stratford-upon-Avon.' The Diary extends from 1648 to 1679; and it contains the following very characteristic entry:—

'I have heard that Mr. Shakspeare was a natural wit, without any art at all; he frequented the plays all his younger time, but in his elder days lived at Stratford, and supplied the stage with two plays every year: and for it had an allowance so large, that he spent at the rate of 1000*l.* a year, as I have heard.

'Shakspeare, Drayton, and Ben Jonson had a merry meeting; and, it seems, drank too hard, for Shakspeare died of a fever there contracted.'

Shakspere's annual expenditure, and the merry meeting, and the hard drinking, are probably exaggerations. They however show that our opinion that Shakspere continued to write for the stage after he had ceased to be an actor has some foundation; and that his residence in comfort and affluence at Stratford did not necessarily imply an abandonment of all his former pursuits. 'Henry VIII.,' upon every rational construction of evidence, was produced at the Globe theatre in 1613, and was then a new play.

We approach the end. Shakspere, according to the register of Stratford, was buried on the 25th of April, 1616.

He survived the marriage of his daughter Judith to Thomas Quiney only two months, and he made his will probably upon the occasion of that marriage. It is dated the 25th of March, but in the document *February* was first written, and afterwards struck out. By this will, which is long, he gives his real estates to his eldest daughter. According to the received interpretation of his will, Shakspere treats his wife with neglect and 'bitter sarcasm,' for which estranged affections would have been no warranty; and consigns her, with a solemn avowal of contempt and hatred, to a miserable dependence, not even recommended or implied, upon the bounty of their common children. According to the dictum of Malone, who first dragged this part of his will into notice sixty years ago, 'His wife had not wholly escaped his memory; he had forgot her,—he had recollected her,—but so recollected her as more strongly to mark how little he esteemed her; he had already (as it is vulgarly expressed) *cut her off, not indeed with a shilling, but with an old bed.*' It was the object of Shakspere by this will to perpetuate *a family estate.* In doing so did he neglect the duty and affection which he owed to his wife? He did not. His estates, with the exception of a copyhold tenement, expressly mentioned in his will, were *freehold.* His wife was entitled to *dower.* She was provided for amply, *by the clear and undeniable operation of the English law.*

SHALE. Any argillaceous deposit, naturally divided into laminæ parallel to the plane of deposition, is rightly so called by geologists. These are sandy, calcareous, purely argillaceous, and carbonaceous shales. Geologists sometimes, very inconveniently, call fine-grained very laminated shales by the title of Slates. A synonym in the north of England mining-districts is Plate.

SHALLOT. [ALLIUM.]

SHAMOU'L, or SAMOU'L, called by Abul Faraj ('Hist. Dynast.,' p. 408) *Samoúl Ben Yehoúda al-Magrebi al-Andalousi;* by Ibn Abi Osaibia (*Oioún al-Ambá fi Tabacát al-Atebbá*, 'Fontes Relationum de Classibus Medicorum,' cap. xi., § 18) *Samoúl Ben Yahia Ben Abbás al-Magrebi;* and by the anonymous author of the 'Arab. Philosoph. Biblioth.' (quoted by Casiri, 'Biblioth. Arabico-Hisp. Escur.,' tom. i., p. 440) *Shamoúl Ben Yehoúdá al-Andalousi*, an eminent Jewish physician, who (as his name implies) was born in Spain, and was descended from an African family. He came with his father (who was also a great philosopher) to Azerbiján, and settled himself at Maragha, a place afterwards famous in oriental geography for the observatory of the celebrated astronomer Nasireddin (born A.H. 598, A.D. 1200; died A.H. 673, A.D. 1273). He particularly studied astronomy, geometry, mathematics, and medicine, and wrote several works on those sciences, of which one exists in MS. in the Bodleian Library at Oxford (Uri, *Catal.*, p. 209; Nicoll and Pusey, *Catal.*, p. 603). He was for some time attached to the service of the Pehlewanides, an Atabek dynasty of Azerbiján, founded by Ildeghiz about the middle of the sixth century after the Hejra, or the twelfth of our æra (see De Guignes, 'Hist. des Huns,' &c., liv. 13, tom. ii., p. 247). He embraced the religion of Mohammed, and wrote a work against the Jews, in which he accused them of having interpolated the Mosaic Scriptures. His children belonged also to the medical profession. He died at an advanced age at Marágha, according to Abul Faraj and the anonymous author quoted above, about A.H. 570 (A.D. 1174-5); according to Hajji Khalfa (and more probably), A.H. 598 (A.D. 1201-2).

SHANFARAH, an Arabian poet, who lived before Mohammed. He was a very swift runner, and his name became proverbial in Arabia. Having sworn vengeance against the family of another Arab called Salman, he surprised and killed many of its members, but was at last taken himself and put to death. A beautiful poem of Shanfarah is extant, which is entitled 'Lamiyatu-l-arab.' It has been translated by De Sacy, and published in his 'Chrestomathie Arabe' (Paris, 1806), with excellent remarks. It is one of the oldest poems extant in Arabic. *Lamiyat* means any poem rhyming in the letter *lam;* and it was called *Lamiyat* of the Arab, to distinguish it from a later poem by Toghrai, a Persian poet who wrote another poem, which bears the title 'Lamiyatu-l-ajem,' or that of the Persian.

SHANG-HAE, a sea-port in China, situated near 31° N. lat. and 121° E. long., is built on the left bank of the river Woo-sung, which is properly only the channel by which the waters of the Lake Tahoo or Taï (the Great Lake) are discharged into the sea. Though the course of the river probably does not exceed fifty miles, it brings down a great volume of water, and is very deep. Opposite the town of Shang-hae, which is about ten miles from its mouth, the depth in the middle of the stream varies from six to eight fathoms, so that the largest vessels can come up to the harbour, and unload alongside of the commodious wharfs and large warehouses which occupy the banks of the river. At this place the river is nearly half a mile wide.

The town is very large. The streets are narrow, and many of them are paved with small tiles, similar to Dutch clinkers, which make a more agreeable footing than the slippery granite with which other towns in China are paved. The shops in the city are generally small, but wares of all descriptions are exhibited for sale; many of them contain European goods, especially woollens. Du Halde, in his 'Description of China,' says, that in this town and its neighbourhood 200,000 weavers are occupied in making plain cottons and muslins; and Lindsay adds, that the nankeen cloth from Shang-hae is said to be the best in the empire.

This is all that we know of a place which is the principal emporium of Eastern Asia, and whose commerce is as active as that of any other place on the globe, not even London excepted. It is certainly a very remarkable circumstance that such a commercial town has only once been visited by a European vessel, and that not before 1832, when the Amherst, under the command of Capt. Lindsay, entered the Woo-sung river. It is only from Capt. Lindsay's statement that we know anything of the great commerce of this place. He says,—'On our arrival at Woo-sung (a small town only a mile above the mouth of the river of that name), I was so struck with the vast quantity of junks entering the river, that I caused them to be counted for several successive days. The result was, that in seven days upwards of 400 junks, varying in size from 100 to 400 tons, passed Woo-sung, and proceeded to Shang-hae. During the first part of our stay, most of these vessels were the north-country junks with four masts, from Teen-tsin (Thian-tsin on the Peïho) and various parts of Manchow Tartary, flour and peas from which place formed a great part of their cargo. But during the latter part of our stay, the Fokien (Fukain) junks began to pour in to the number of 30 or 40 per day. Many of these were from Formosa, Canton, the Eastern Archipelago, Cochin-China, and Siam.' Now if we suppose that the commerce of Shang-hae is as active the whole year round as Capt. Lindsay found it to be in the month of July, we come to the conclusion that this port is annually visited by shipping to the amount of 5,000,000 tons. In 1838 the shipping that entered the port of London did not quite amount to 4,000,000 tons; namely, 1,061,923 tons employed in the foreign trade, and 2,908,176 tons in the coasting trade. [LONDON, vol. xiv., p. 128.] But as Capt. Lindsay observes that the winters in these parts are rather severe, and that the snow sometimes lies several feet deep for more than a month, we may suppose that the navigation of the Woo-sung is annually interrupted for four or six weeks, and thus the commerce of Shang-hae would be reduced nearly to a level with that of London. But though the commerce of Shang-hae is perhaps more active than that of the British metropolis, its sphere is much more limited, as the most remote countries with which it is connected towards the south are Siam and the Sooloo Archipelago, towards the east Japan, and towards the north the province of Leaotong and Mandshooria, whilst London receives merchandise from all the world.

It certainly excites some surprise to find that so active a commerce is carried on in a place which has hardly any commercial relation with foreign countries. But our surprise will cease if we consider that there is no harbour on the Chinese coast between 30° and 35° N. lat., or between the bay of Ningpo on the south, and the peninsula of Shantung on the north. On this tract of coast the two largest rivers of China, the Yellow River and the Yant-se-kiang, enter the sea, and they bring great quantities of earthy matter, which they deposit along the coast, and thus render the whole tract inaccessible to boats beyond the size of a fishing-barge. The Woo-sung is the first river south of the Yant-se-kiang which is deep enough for the purposes of navigation, and hence the whole maritime commerce of this tract is concentrated at Shang-hae. The country which lies at the back of the coast is the most populous part of China, and contains many very large towns, among which those of Soo-tsheou-foo and Hang-tsheou-foo probably contain a million of inhabitants each, and there are others which may vary between *100,000* and 500,000, among which is the antient capital of China, Nankin. [NANKIN.] According to the Chinese census, the country between 30° and 35° N. lat., extending from the sea about 200 miles inland, and comprehending the antient province of Ki-an-gnan, or the present provinces of Ngan-hoë and Keang-soo, contains, on a surface not exceeding 70,000 square miles, a population of more than 40,000,000, or about 600 inhabitants to each square mile. Such a population cannot subsist on the produce of the soil even in the high state of agriculture by which this region is distinguished above all other parts of China. A considerable supply of provisions must be required every year. Such an inference must also be drawn from what is stated by Capt. Lindsay, namely, that the northern country vessels bring chiefly corn and peas; and though he does not mention the cargoes of the Fu kian vessels, which come from the Eastern Archipelago, Cochin-China, and Siam, it is a known fact that the principal article of export from these countries to China is rice. The immense quantity of grain which is carried into the port of Shang-hae is probably not consumed in that town and the neighbourhood; but a part of it reaches the centre and even the western districts of China Proper, by being conveyed on the numerous canals which are connected with the Imperial canal or Yoon-ho and the two great rivers above mentioned. The exports probably consist of manufactured goods, and the inhabitants pay for the food which they obtain from other countries by supplying their inhabitants with cotton, silk, and linen fabrics.

The islands of Cheusan are situated about 60 or *70* miles to the south-east of Shang-hae. These islands were taken possession of by the British in July, 1840. On the news of this event consternation spread to Peking. The Chinese government came forward with proposals, and seemed extremely anxious to terminate the war by peace on any terms, provided the islands of Chensan were restored. This readiness on the part of the Chinese was certainly not in accordance with their former policy, and the obvious conclusion was that they were alarmed at the progress of the British arms. Now however it is said that the Chinese have resumed their former behaviour; they have retracted their proposals; they have resisted the most moderate demands, and are prepared to repel force by force. What has produced this change? Tho islands of Chensan have been abandoned, it is stated, on account of their unhealthiness. It is evident that the Chinese government feared lest the British should retain these islands and fortify them against all attacks. In possession of these islands a few vessels of war and steam-boats would have been sufficient to prevent any supply of grain into Shang-hae, and thus the English would have had it in their power to starve the great population which depends annually on these supplies.

(Lindsay's 'Voyage of the vessel Amherst along the

Coast of China,' in *Parliamentary Report*, 1831; Du Halde's *History of China*; Staunton's *Account of an Embassy from the King of England*; &c.)

SHANNON, not only one of the largest rivers in Ireland, but likewise in the British empire. It runs for 220 miles from its source to the sea, and affords a navigable, though at present imperfect line of communication, which nearly intersects Ireland from north to south. It rises within eighteen miles of Sligo, and expanding at intervals into lakes, falls into the sea between the Loop and Kerry heads, fifty-six miles below Limerick. The Shannon is the outlet for the waters of an immense tract of country, and it gives facilities for maintaining commercial intercourse, not only by its communication with the sea, but also with the metropolis by means of two canals. It divides Ireland nearly into two parts, separating the province of Connaught from the rest of the kingdom. This river must be viewed under two distinct heads, as it is locally known under two distinct names, namely, the Lower Shannon, including that portion of the river below Limerick, which is connected with the external commerce of the country; and the Upper Shannon, from its source down to Limerick, which is connected with its internal commerce.

The source of this noble stream is generally considered to be a circular basin of about twenty feet in diameter (and said to have been sounded with 200 yards of line without finding bottom), situated at the southern base of the Kulkeagh Mountain, whence it flows in a deep dead sluggish stream into Lough Allen, in the county of Leitrim, a small basin about eight miles long and three to four broad, lying in the midst of a coal district, and 115 feet below the level of the source. Other small streams fall into this lake, any one of which may be considered the parent of this great river. Of these the largest are the Owenmore, the Arigna, which joins the Shannon before falling into the lake, and the Dorbally. The mountain scenery around Lough Allen is very fine. The land slopes gently to its sides, is well wooded, and cultivated to nearly half the height of the mountains.

Leaving Lough Allen, the river is so obstructed by shallows, that a canal, passing to the eastward of it, has been cut from its southern extremity near Drumshambo, to Battle-bridge, a distance of nearly five miles. In this distance there is a fall of twenty-two feet, which is overcome by two locks, one at Drumleague, half way along the canal, and another at Battle-bridge, where the river navigation is resumed. From this point the river runs in a southerly direction, between shores generally low, with a mid-channel depth varying from five to twenty feet, for six miles, when it receives the waters from two small lakes called Boyle Water and Lough Key, which communicate with the town of Boyle. A mile below this point stands the town of Carrick-on-Shannon, and two miles farther occurs a small expansion called Corry Lough, whence the course of the river is tolerably straight and good as far as Jamestown, a distance of two miles. Here a shallow circuitous bend is avoided by a canal two miles in length, which commences just above Jamestown, and terminates about a mile and a half below Drumsna. On this canal there is a lock with a fall of six feet eight inches on the sills. From a mile below this canal nearly down to Ruskey are a series of small lakes surrounded by low hills, with diversified and in some parts well-wooded scenery, and a tolerably free navigation. These lakes are called Lough Tap, Lough Boedarrig, Lough Boeflin, and Lough Sconnell.

At Ruskey is a stone bridge over the Shannon, which is here very shallow and much obstructed by eel-weirs. The navigation is carried on by a canal three-fourths of a mile long, on the north side of the river, with one lock on it, having a fall of 4 feet 11 inches. Two miles and a half below Ruskey the Shannon enters Lough Forbes, immediately above which the river is nearly dry in summer, though the bed of the river is sufficiently broad. This lake is an irregularly shaped basin two miles long and from a half to three-quarters broad: the water is of the average depth of seven or eight feet, excepting a shoal of small extent near the centre, where the lake is contracted to a breadth of only 350 yards. Lough Forbes is almost surrounded by bog-land, except where a portion of the demesne of Lord Forbes comes down to its eastern shore. From the southern extremity of Lough Forbes the navigation by the river becomes impracticable, and continues so below Tarmonbarry, a small village three miles lower down, where the Shannon is crossed by a stone bridge built on a rocky ford. The communication is therefore carried on by the tributary river Camlin, which empties itself into the Shannon by two mouths, the upper one at the southern extremity of Lough Forbes and the lower one below Tarmonbarry. The lower mouth of the Camlin is however so shallow that a short canal about half a mile in length and with one lock on it has been cut, and near the point of its junction with the Camlin, near the village of Cloondrah, is the grand depôt of the Royal Canal Company, called Richmond Harbour.

Between this and Lanesborough, a distance of seven miles, some few difficulties occur; the river is of an average breadth of 250 yards, not very tortuous, and the depth is frequently 20 feet, though there are some spots with only four; the shores are of bog and very flat, except where a few isolated hills of good land stand near the river. At Lanesborough the Shannon is crossed by a stone bridge, built as usual on a ford of rock and gravel, which obstruction is overcome by a short canal a quarter of a mile long, on the Roscommon side of the river, and merely separated from it by an embankment. This canal has one lock. We here enter Lough Ree (the second expansion of the Shannon in point of magnitude as it is in order from the mouth) which extends 16 miles in a north and south direction, and varies in breadth from three-quarters of a mile to three miles; it reaches within two miles of Athlone. About half way along its eastern shore is a deep indentation, called Derry Bay, at the head of which the river Inny, the only one of any magnitude, falls into the lake. The depth of water in the lake is very irregular; the greatest depth is 120 feet, but this occurs only in few places, and the average depth may be considered at from 20 to 30 feet. The bottom is a slate-coloured mud, except where gravel beds rise and form shallows, which are very numerous, and always contain large masses of limestone rock, which probably forms the basis of the shoal, as all the strata of the surrounding country are of that description. The scenery of the lake is diversified, and, studded as it is with so many islands, frequently becomes picturesque. There is a scarcity of wood, and the land does not in any place exceed 250 feet above the surface of the lake; the shores are unfavourable for landing, being shallow and stony. Not a single village is visible from the lake. Two miles above Athlone, the river becomes narrow and is very much obstructed by eel-weirs and shallows; and under Athlone bridge, which is of stone, there is a considerable fall and rapid. These impediments are surmounted by a canal on the Roscommon side, one mile and a half in length, with one lock on it having a fall of four feet four inches. Between this place and Lough Derg the river makes two large bends, and dividing itself into various branches forms islands, some of which are of considerable size. Eight miles below Athlone stands the Seven Churches, a place which still retains much of its former sanctity, and between these two points the river is free from any serious obstruction, as indeed it continues to be as far as the military post called Shannon bridge, five miles and a half farther. Here the occurrence of a shallow ford with the advantage of firm ground on each side has led to the choice of the place as the site of a stone bridge over the river, and as there is a fall of seven inches over the shallow, a side canal about 250 feet long has been cut on the eastern side with a lock on it, and just below (where the river Suck falls into the Shannon) a smaller one of about the same length has been made through a sharp projecting point. The Suck, which forms the division between the counties of Galway and Roscommon, is a very fine river, and appears at its junction scarcely inferior to the Shannon itself. It rises near Castlereagh in the county of Roscommon, and has a circuitous course of about 60 miles, receiving in its passage a number of tributary streams. It passes near the towns of Roscommon, Athleague, Mount Talbot, Ballyforan, Ballygill, and through Ballinasloe, and is the largest of the tributaries of the Shannon. From the junction of the Suck down to Shannon Harbour the river is of equal and considerable breadth with few obstructions. At Shannon Harbour the Brusna falls into the Shannon on the east side, and just at this point is the junction of the Grand Canal with the Shannon; immediately opposite is another canal running up to Ballinasloe, and for the facility of communication and transporting boats (both canals belonging to the Grand Canal Company), a wooden bridge has been thrown across the Shannon from one to the other. To Banagher, two miles lower, there is a good and uninterrupted navigation. Here there is another stone bridge across the Shannon, built on a bank of gravel; and the fall of one foot nine inches occasioned by it is avoided by a canal about a quarter of a mile in length on the Galway side with one lock upon it. About three miles below Banagher the navigation becomes greatly impeded by shoals and falls, to avoid which there is a canal two miles in length on the Leinster side with one lock on it. This has been cut to avoid the falls of Meelick and Killogues, which are the greatest in the whole line above Killaloe, amounting to seven feet three inches. At the point where the river navigation is again resumed, the Lower Brusna falls into the Shannon, which again offers a wide and uninterrupted channel into Lough Derg, a distance of nine miles, with a water-course, marked out by piles, which generally exceeds 20 feet in depth. One remark will suffice on the nature of the shores between Loughs Ree and Derg: they are uniformly very low, consisting of lands of a rich calcareous nature, always overflowed during the winter season, and producing in the summer large crops of rank coarse grass, and affording pasturage for cattle. These rich lands are generally backed by bog-land elevated from 20 to 30 feet above the river, and towards Athlone by low rounded isolated limestone hills. There are few places where good firm land comes down to the river's edge. At the town of Portumna is a wooden bridge with stone piers, now in course of erection, across the Shannon, and about a mile below this we enter Lough Derg, which is 24 miles in length, lying about north-north-east and south-south-west, and varying in breadth from three-quarters to three miles direct distance, though there are some large bays on both sides which in some places cause an expanse of seven to eight miles. The scenery of this lake is very beautiful, especially towards the southern extremity, where it lies between hills of considerable elevation terminating abruptly on the lake. All the north-western shore, which forms part of the county of Galway, are low and abound in bog-land. In this portion lie the Ballyshrule and Woodford rivers, streams of considerable size and navigable for large boats. The Tipperary shore, which forms all the eastern side of the lake, is greatly diversified in appearance and character: to the north it consists of rounded limestone-hills, which are chiefly used for pasture, while to the south the mountains are higher, more abrupt, and consist of slate formation, which is worked to great advantage. The opposite shore, part of the county of Clare, is of like formation. Lough Derg contains few islands, but it abounds in rocks and dangerous shoals, and the shores, like those of Lough Ree, are difficult of approach from being so shallow and stoney. The greatest depth is 120 feet; the southern portion is generally much deeper than that to the northward. The bottom is of marl, which is dredged up in great quantities for manure. On this lake a steamer of 90 horse-power plies daily between Killaloe and Portumna, for the purpose of towing the lumber boats which go to Dublin by the Grand Canal across the lake. A considerable passenger-trade is also carried on by this route, especially in summer. At Killaloe is the chief depôt and dockyard of the inland department of the Dublin Steam Navigation Company.

About a mile above Killaloe the channel becomes very narrow, although it is free from obstructions till a little way above the bridge, where a bed of rocks impedes the navigation, as well as numerous eel-weirs which are found at all the bridges along the Shannon. A series of falls continues below Killaloe bridge, so that a canal two miles long has been cut close by the river on the Clare side. On this canal there are three locks, the lowest of which is a double one, with a fall of 22 feet in the whole distance, after which the navigation of the Shannon is again resumed in a clear broad stream with only one difficulty as far as O'Brien's bridge, five miles below Killaloe, where the river is again crossed by a stone bridge. About a mile below this commences another series of falls, passing the beautifully-situated village of Castle Connell, and extending for about 7 miles. The canal for avoiding these falls is also on the Clare side; it has two double and four single locks on it, which overcome a fall of 62 feet. Below this the navigation of the Shannon is resumed for one mile and a half, and the communication with the Lower Shannon at Limerick is finally completed by a third short canal a mile long, with two locks and a fall of 13·4 feet. Along the navigable parts of this portion of the Shannon, the land, though good, is generally so low that it becomes necessary to make use of embankments to keep out the water. Immediately above Limerick the river divides into two branches, forming King's Island, on which the old town stands, with the cathedral, castle, and other public buildings. Just above the reunion of these two branches is the last fall of the river.

In reviewing the Upper Shannon, the following general observations offer themselves. This river, which seems by nature formed to facilitate the agricultural and commercial improvement of the kingdom, instead of having been assisted by art, has been rendered almost useless; first by a contracted canal navigation made without any regard to the dimensions of the locks or the level of their sills; secondly, by the improper construction of the several bridges, which choke up the river's course, not only by their numerous piers, but by the mills erected in the arches themselves; also by the mill dams, which in some parts occupy nearly the whole breadth of the river; the numerous eel-weirs, and the total neglect of dredging away small shoals; thirdly, by the want of proper beacons and landmarks. All these deficiencies not only render navigation difficult and dangerous, but the obstruction thus arising to the free course of the winter's floods causes large tracts of the adjacent country to be inundated during that season. To remove these defects it is proposed to do away at certain points with the useless canals and locks, to deepen the bed of the river where requisite, at the same time to erect, at proper places, weirs so regulated as always to keep up a certain level of water during the summer, while they would allow the superfluous waters of the winter to pass off freely; also to cut new canals with lockage on a more extensive scale, so as to admit of the passage of steamers. For this purpose an act of parliament has been passed, and a sum of money granted, and the contemplated improvements are now in progress.

Of the rivers which fall into the Lower Shannon, the Woodford, Ballyshrule, Lower Brusna, and Suck, might be made navigable at little expense, and would open a great district of country.

Under the name of Lower Shannon is comprehended that part of the river below Limerick which is navigable for sea-going vessels. This æstuary is easy of access, and its approach is free from dangers; the entrance between the Loop and Kerry Heads is seven miles wide, and on the former stands a lighthouse, showing a bright fixed light at the height of 270 feet above high-water. About 10 miles to the eastward is a kind of second entrance between Kilkadran and Beal Points, which is contracted to one mile and a half; and off Beal Point a dangerous sand-bank extends nearly half a mile, which still further reduces the navigable channel. On Kilkadran Point is a lighthouse which exhibits a fixed red light 133 feet above the sea, and inside this point is the small bay of Carrigaholt, which affords good shelter for small vessels. Above this there is anchorage in every part of the Shannon, though Scattery, Tarbert, Labasheda, and Foynes, are the only places which offer good shelter from the prevailing westerly winds.

Five miles above Kilkadran Point is Scattery Island, on the Clare coast, about three quarters of a mile long, rather low and marked by one of the Round Towers; it has a battery on its southern point. To the eastward of this island there is good anchorage. On the Clare shore opposite Scattery stands the village of Kilrush, which is much frequented as a watering-place by the inhabitants of Limerick. A good stone pier has been built for the accommodation of vessels loading, as well as for landing passengers: a steamer plies daily between this place and Limerick, calling at Tarbert.

About five miles to the south-east of Scattery is Tarbert Peninsula (formerly an island), at the north-east point of which, on a rock connected with the mainland by a bridge, is a lighthouse showing a brilliant fixed light 58 feet above the sea. To the south-east of this peninsula there is excellent anchorage, and a temporary pier has recently been erected. The village of Tarbert is about a mile from the landing-place, across the isthmus. Above this the river contracts to less than a mile in width. Opposite Tarbert a peninsula stretches out leaving to the northward of it a deep bay running up about three miles to the village of Cloonderlaw, which gives its name to the bay, and lying as it does more in the direction of the Shannon, is sometimes mistaken for the true course of that river which here turns more to the south-east. To the eastward of this peninsula, and about four miles from Tarbert is Labasheda Bay, another good anchorage, well sheltered from westerly winds; and about four miles further up, on the Limerick side, is Foynes

Island, between which and the mainland there is a good harbour, though the entrance is rather intricate.

A little above Foynes, on the opposite coast of Clare, are a number of small islands, which form the western entrance of the river Fergus, and lie more than half way up the Shannon towards Limerick. Below this the river presents a different appearance from that above the confluence of the Fergus; the land on both sides is high and bold, with a beach either of shingle or gravel beneath, and the channel free from dangers, whilst above this point the land is so flat and low, that with little exception the whole shore on each side is one continued line of embankment, with the mud drying off in many places to the extent of half to three-quarters of a mile. Besides this, there is throughout this portion a number of islands, rocks, and shoals, down the centre of the river, which divide it into two channels. Most of these islands are covered at high-water, a circumstance which gives to the Shannon a very different appearance at the different times of tide; and the river, which, at high-water, has often been called mighty and majestic, becomes at low-water, a very insignificant and unnavigable stream. For eight or nine miles below Limerick the river is so shallow that at low-water every vessel must lie aground; and even far below this there is not a spot where a landing can be effected except through the mud. In addition to these natural difficulties this part of the river is in an equally neglected state with the Upper Shannon, being without beacons, buoys, or land-marks.

At Limerick a very fine range of quays is now in course of construction furnished with cranes, &c., and it is proposed to construct a weir across the river below the town, with proper gates to admit vessels at high water, so as to constitute a floating dock of the whole river above the weir. This would be a most valuable improvement to the port, for all vessels are now obliged to lie aground at low water, much to their injury when deeply laden, as there is not more than five feet water off the town at low tides.

Several rivers join the Lower Shannon, among which the Fergus deserves some notice, as it is navigable for vessels of 200 to 250 tons at high water as far as Clare, nine miles from its confluence with the Shannon. At this part it is very narrow, but about two miles lower it begins to expand to a considerable width, though the navigable channel still remains very confined, the remaining space being filled with extensive mud banks and low islands which are covered with the flood tides.

About nine miles below Limerick the Maigue falls into the Shannon on the Limerick side; though narrow, it is free from obstructions, except a rocky bar across the entrance, and is freely navigable for boats of 40 to 50 tons deeply laden as far as Adare, about eight miles from its mouth. The Askeaton river, which also enters the Shannon on the Limerick side, is not so large as the Maigue, but is still navigable with some difficulty for boats. There are also numerous other streams, many nearly dry at low water, though accessible at high water.

The spring tides in the Shannon rise from seventeen to eighteen feet, the neaps about fourteen feet; the velocity which at the mouth does not exceed a mile an hour, increases as the river becomes narrower, to upwards of three during the ebb at springs; in consequence of which the young flood has so much resistance to overcome that when it does so it rushes up almost like a bore, and the water rises during the first hour's flood as much as seven or eight feet, by which time a great portion of the mud banks become covered, and from having a more expanded space to vent itself in, the velocity becomes very much diminished.

The following is a list of public bridges over the Shannon:—

List of Public Bridges.

	Waterway. Feet.	Distance between. Miles.
Ballytra	85·6	
New Bridge	78·0	½
Drumsherriff	82·6	2
Battle Bridge	113·4	2½
Carrick	233·10	6
Jamestown	139·4	6
Drumsna	175·	1
Ruskey	199·3	8
Tarmonbarry	220·6	10
Lanesborough	206·0	7
Athlone	210·6	19
Shannon Bridge	336·0	14
Shannon harbour (wooden)	450·0	6½
Banagher	295·6	2
*Portumna (partly wood)	732·8	13
Killaloe	402·11	24
O'Brien's Bridge	296·8	5
Athlunkard	335·0	7½
Thomond	335·7	1½
Wellesley	350·0	½

Rise of the Locks on the Shannon, taken from their Sills.

	ft.	in		
Wellesley Dock Gates	11	4		
Park	1	10		
Annaghbeg	8	7		
Gillogues (double)	11	0		
Newtown	8	2		
Cloonlara	10	7		
Monaskea	10	4		
Errina (double)	13	4		
Cussane (double)	15	5		
Moy	6	8		
Killaloe	0	0		
			97	2
Hamilton	10	6		
Banagher	0	6		
Shannon Bridge	2	4		
Athlone	4	4		
			16	8
Lanesborough	1	3		
Cloondrah	5	11		
Ruskey	4	11		
Jamestown	6	8		
Battle Bridge	10	3		
Drumleague	11	9		
			40	9
Total rise of sills			154	7

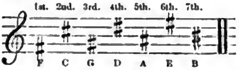
(*Parliamentary Reports; Recent Surveys.*)

SHAPOOR. [Persia—*History.*]

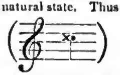
SHAPUR, or SHAPOOR. [Persia.]

SHARK. [Squalidæ.]

SHARP, a character in Music (♯), used to raise, by the degree of a semitone, any note in the natural scale. Before the character of the *natural* was introduced, the sharp was also employed to contradict the flat. When sharps are placed at the clef, they are always taken, according to the number required, in the following order:—



The double sharp, the character for which is a cross (×), is used in chromatic music, and raises a note two semitones above its natural state. Thus c *double sharp*



is, practically—though not strictly so in theory—d natural. [Flat.]

SHARP, JAMES, archbishop of St. Andrews, was born in May, 1618, in the castle of Banff, where his father, Mr. William Sharp, resided in his quality of sheriff-clerk of the county. Sharp's paternal grandfather had been a merchant of considerable eminence in the town of Aberdeen, and was the younger son of a gentleman of landed property in Perthshire. Sharp's mother, Isabel Lesly, a daughter of the laird of Kinninvy, and nearly related to the family of the earls of Rothes, is described as having been an extraordinary woman, honoured by all for her wisdom and piety. She survived to a great age, and lived to see at least King Charles's restoration, and her son fairly mounted on the ladder of advancement, if not his actual elevation to the primacy.

* An island midway.

Sharp was educated at the university of Aberdeen, where he is said to have distinguished himself in the studies then in vogue. On leaving college he paid a visit to England, but soon after returned to his native country on being chosen one of the regents, or professors of philosophy, in St. Leonard's College, St. Andrews, an appointment for which he is said to have been indebted to the interest of his relation the earl of Rothes, to whom he had got himself introduced while in the South. His whole history evinces the great talent he had in insinuating himself into the favour of the great. After a short time he exchanged his professorship for the office of minister of the parish of Crail, no doubt a better living, to which he was appointed by his friend John, earl of Crawford and Lindesay.

These facts are given on the authority of a tract entitled 'A True and Impartial Account of the Life of the most Reverend Father in God, Dr. James Sharp, Archbishop of St. Andrews,' which is usually quoted as printed in 1723, although, according to Watt's 'Bibliotheca,' it was first published in 1719. The object of the writer is to make it appear that Sharp was disinclined to Presbytery, or at least opposed to the Solemn League and Covenant, from the beginning; but he must at any rate have complied with both when he accepted his professorship and his living in the church. Indeed it is evident that he assumed the appearance of great zeal for the ecclesiastical system now, after the commencement of the civil war, established in Scotland, and with such success as to take in its firmest and ablest friends, so that he enjoyed the full confidence and took part in all the councils of the leaders of the church. His affability and taking manners also, we are told, made him a favourite among his parishioners; so that, according to his panegyrical biographer, he in a singular manner exemplified the evangelical precept as to the wisdom of the serpent and the innocency of the dove.

In August, 1651, according to Sir James Balfour's 'Annals,' Sharp was one of a number of ministers who were seized and put on board ship at Broughty, on the Tay, and carried off prisoners to England, by order of General Monk, who was then overrunning the country. This remarkable passage in his history is not noticed in the common accounts of Sharp; but frequent allusions occur in the Presbyterian invectives to certain base compliances, by which he is asserted to have purchased the favour of Cromwell on some occasion, and to have obtained his liberty, while his companions were left in bondage. He appears, at all events, to have, after some time, found his way back to his charge at Crail.

Some years after this we hear of him being sent up to London with a commission from the party in the church called the Resolutioners, to plead their cause before the Protector against Mr. James Guthrie, minister of Stirling, the deputy of the opposing faction, called the Protestors or Remonstrators; on which occasion he is said to have so distinguished himself by his management and address that Cromwell remarked to the byestanders, 'That gentleman, after the Scotch way, ought to be styled Sharp of that ilk.' He was no doubt selected for this mission partly on account of the connexions he had formed in England. Burnet says, he 'had been long in England, and was an active and eager man; he had a very small proportion of learning, and was but an indifferent preacher; but having some acquaintance with the Presbyterian ministers in London, whom Cromwell was then courting much, he was, by an error that proved fatal to the whole party, sent up in their name to London; where he continued for some years soliciting their concerns, and making himself known to all sorts of people.' Burnet adds, that 'he seemed more than ordinary zealous for Presbytery,' and that when Dr. (afterwards Bishop) Wilkins expressed to him his belief that it would be necessary for the Protector to set up Episcopacy again (apparently meaning both in England and Scotland), if order was ever to be restored to the kingdom, 'Sharp could not bear the discourse, and rejected it with horror.'

It is characteristic of Sharp that, although thus the agent of the Resolutioners, he always, according to his friendly biographer, kept a good understanding with the chiefs of their opponents, the Protestors. While ingratiating himself with Cromwell also, it seems, he maintained a correspondence with Charles II. during all the time of his exile. General Monk was exactly the character for such a man to get into his hands at the critical moment of the Restoration. It is certain that, whatever may have afterwards been thought or said of the acts by which he had obtained his release from Cromwell when his companions were left in confinement, he had either never lost or had completely regained the confidence of his brethren in the church, five of whom, ministers of Edinburgh, and the leading men of their party, when Monk began his march from the North of England upon London, in January, 1660, applied to him to receive Sharp as their representative, and as a person fully instructed in their views and wishes. Among the persons by whom Sharp was thus commissioned were Mr. Robert Douglas, Mr. John Smith, and Mr. Andrew Ker, who had all been carried along with him to England in captivity eight or nine years before.

The seven months that followed form the portion of Sharp's history which is of the most importance to the appreciation of his character. He proceeded to London, where he arrived 13th February, set out for Breda 4th May, returned to London 26th May, and appears to have remained there till about the middle of August. During all this time he was in close communication with all the leading persons and parties of the day; with Monk and the chief of the English and Scottish nobility then in London; with both the Presbyterian and the Episcopalian ministers there; with Charles himself and the members of his court; and he also kept up an active correspondence with Douglas and the other ministers in Scotland by whom he had been deputed. The numerous letters which passed between him and Douglas have been preserved; they are now deposited in the library of the university of Glasgow, and a very full abstract of them has been given by Wodrow in the Introduction to his 'History of the Sufferings of the Church of Scotland from the Restoration to the Revolution.' Mr. C. Kirkpatrick Sharpe, in a note to Kirkton's 'Secret and true History of the Church of Scotland from the Restoration to the year 1678,' observes that 'Wodrow is accused of gross injustice in garbling Sharp's letters to Douglas;' but that writer, whose partisanship is very decided, neither ventures to warrant the truth of this accusation, nor professes to have examined the original letters. On the other hand, the Rev. Dr. Burns, of Paisley, the modern editor of Wodrow's History, having compared, as he tells us, the letters with the abstract, asserts, 'without hesitation, as a general result of the inquiry, that, while the historian does by no means conceal his design of exposing Sharp's treachery, he had it in his power from these documents to have held him up to detestation in still blacker colours, had he quoted all the expressions of affected devotion—all the solemn protestations of attachment to Presbytery—all the specimens of mean adulation, and all the bitter vituperations against his opponents, which these letters contain.' Dr. Burns probably would not wish to be considered a less zealous partisan than Mr. Sharp; but, besides the authority his statement derives from his having actually seen and read the original letters, it appears to us to be probable in itself. Wodrow, though not a critically exact historian, had a most minute as well as extensive acquaintance with the times of which he writes, and is a very careful compiler from the vast store of original documents on which his work is almost exclusively founded; and, although not a person of much enlargement of mind, he cannot with justice be called either a violent or an unfair writer. We believe him to have been entirely incapable of any designed garbling of these letters of Sharp's. His abstract certainly leaves a strong impression of Sharp's thorough dissimulation and treachery. The opinion which Douglas afterwards formed was, it seems, that he had been corrupted and gained over to the Episcopalian side during his visit to Breda, where he was probably much with Hyde, and where Charles himself treated him with the most flattering favour and familiarity; and in this view of the matter Wodrow also appears to coincide. To us his conduct has the air of intrigue and dishonesty from the commencement of his mission; he may not have made up his mind when he left home to support the restoration of Episcopacy in Scotland, but we believe he set out fully determined to take the course as to that matter which promised most for his own advancement, and that what he saw of the current in which things were running after he got to London very soon determined him as to the part he should act. Burnet relates that, some years subsequent to the Restoration, his enemy Lord Lauderdale, 'to complete his disgrace with the king, got many of his letters, which he had writ to the Presbyterians after the time in which the king knew that he was negotiating for Episcopacy, in which he had continued to protest with what zeal he was soliciting their concerns, not without dreadful imprecations on himself if he was prevaricating with them, and laid these before the king, so that the king looked on him as one of the worst of men.'

Some of Sharp's defenders however take up other ground, and, without disputing the correctness of Wodrow's abstract of the letters, deny that they afford any evidence of his insincerity, or that we have any other reason for believing that he was unfaithful to the cause of Presbytery so long as he was employed on this mission. When he returned to Scotland, he brought with him a letter from the king, directed 'to Mr. Robert Douglas, to be communicated to the Presbytery of Edinburgh,' in which his majesty declared his resolution 'to protect and preserve the government of the church of Scotland, *as it is settled by law*, without violation.' This letter Sharp's enemies will have to have been of his composition: its mode of expression was at least ingenious. The Scottish parliament, which met 1st January, 1661, passed an act—suggested, according to Burnet, at the council-table in a drunken bout—rescinding or repealing all acts passed since the year 1633; and this at once abolished any legal establishment that Presbytery had ever received, and made 'the church as it is settled by law' to mean the old Episcopal church which had been overthrown in 1638. During his late absence from Scotland, Sharp had been elected professor of divinity in St. Mary's college, St. Andrews; he was also appointed his majesty's chaplain for Scotland, with an annual salary of 200*l.* sterling; and now, having gone up again to London, on the rising of parliament, along with Glencairn, the chancellor, and Rothes, the president of the council, he was, in a council held at Whitehall, nominated archbishop of St. Andrews. He returned to Scotland with the same two noblemen on the 31st of August, and left again for England on the 18th of October; and about the middle of December he and three of his brethren were consecrated with great pomp at Westminster by the bishops of London and Worcester.

The history of Sharp's government of the Scottish church cannot be here detailed. He certainly did not allow any recollections of his own very recent renouncement of Presbyterianism, or of the extreme zeal he had been wont to profess for that system of ecclesiastical government, to check his activity and ardour in the maintenance of the opposite order of things that had been now set up. The party he had deserted charge him with an unrelenting persecution of his old associates, of all who would not apostatise like himself, as well as with the most overbearing deportment even to those of his own communion who were his inferiors in station, and with an insatiable ambition; and it cannot be denied that many well-authenticated facts lend strong countenance to these imputations. He may have conscientiously believed such a policy to be necessary, or to be the wisest and best; but whatever were his views or motives, it is certain that we find him on all occasions the advocate for measures of rigour and severity, and constantly clamouring for the more strict execution of the laws against nonconformists.

In 1663 he left the declining interest of the earl of Middleton, to whose support he had been mainly indebted for his nomination to the primacy, and attached himself to his old adversary the earl of Lauderdale; but their association scarcely lasted two years.

In 1664, on the death of the earl of Glencairn, he made strong application for the office of lord-chancellor, but without success. In the beginning of the year 1667 he was commanded to come no more to the council-table, but to remain within his diocese; but this restraint was taken off before the end of the year. On Saturday, the 9th of July, 1668, he was shot at as he was entering his coach in the streets of Edinburgh, by one James Mitchell, a conventicle preacher; but the ball was intercepted by the arm of the bishop of Orkney, who was following him into the coach. The bishop's arm was shattered, but nobody attempted to apprehend the assassin, who was discovered however five years afterwards, and executed in January, 1678, after a series of proceedings which, at least according to one version of the story, are little creditable to Sharp's magnanimity. At last, on Saturday, the 3rd of May, 1679, the archbishop, while travelling with his eldest daughter from Kennoway, where he had passed the night, to St. Andrews, was attacked by a band of nine enthusiasts on Magus Muir, within three miles of that city, dragged from his coach, and slaughtered on the spot with circumstances of the most furious and pitiless barbarity. Various narratives of this murder have been collected by Wodrow, and one has been added by Dr. Burns, in his late edition of that historian's work (4 vols. 8vo., Glasgow, 1829); but the most detailed and in all respects remarkable account of the affair is that drawn up by James Russell, one of the actors in it, which has been for the first time printed by Mr. Sharpe at the end of his edition of Kirkton's History. The same volume also contains a letter from Sir William Sharp, the archbishop's son, giving an account of his father's murder, dated St. Andrews, the 10th of May.

Wodrow and Burnet, in particular, are very full of notices of Sharp; and a separate Life of him was lately published by the Rev. J. P. Lawson; but the amplest materials for his history still remain in manuscript. Besides the Life published in the beginning of the last century, there is another old memoir of an opposite strain, which has also been printed; and Mr. Sharpe quotes a MS. biographical libel, entitled 'A Character of the Monster of Inhumanitie, who is the Great Reproach of Mankynd,' &c., which is in the Advocates' Library, and is perhaps the Life of the archbishop 'until his arriving at the top of his ambition,' which Wodrow says he had read, 'written by one of the after-sufferers, a worthy gentleman.' Specimens of the style in which his course was wont to be sketched even by sober and serious Presbyterian writers may be seen in Kirkton, i. 81-84, and in Wodrow, i. 236 (Glasg. edit.). In the midst of some strange stories, Kirkton says, 'He was a man of parts and a scholar, as he showed himself when a regent in St. Andrews, but a scholar rather cautious than able; rarely would he ever engage in a dispute, lest he might fall under disadvantage, and never would he be the opponent, which he knew was the most difficult part. His great gift was his prudence, dissimulation, and industry.' Wodrow speaks of a proposal he made to Cromwell, 'which made the usurper very publicly assert him to be an atheist;' and Kirkton affirms that he was taken to be no better than a 'flat atheist' by all that knew him. On the other hand, it is asserted that his moral demeanour was always at least decent and regular; that he was a patron of learning, and that his secret pecuniary charity even extended to the deposed Presbyterian clergy and the other poor of that persuasion.

By his wife Helen Moncrief, daughter of the laird of Randerston, Archbishop Sharp left a son, Sir William Sharp, and two daughters, both of whom were married, the youngest, Margaret, to William, eleventh Lord Saltoun, the ancestor of the present lord. His portrait, from a painting by Lely, is engraved in Sharpe's Kirkton, and also in the last edition of Wodrow. The spot where he was murdered on Magus Muir is still marked by a stone erected to the memory of Andrew Guillan, one of the only two of the party who were brought to justice, whose body was there hung in chains; it is now an open space in the midst of a fir plantation, the course of the antient high road having been changed. There is a magnificent marble monument erected to the archbishop by his son over the place where his remains were interred in the parish-church of St. Andrews, exhibiting, besides a representation of the murder, a long and highly laudatory inscription, a copy of which, with a short account of the archbishop, may be found in the 'Reliquiæ Divi Andreæ' of Mr. George Martine, who is supposed to have been his secretary (4to., St. Andrews, 1797).

SHARP, JOHN, archbishop of York, was born at Bradford, 16th February, 1644; his father, Mr. Thomas Sharp, was engaged in trade there, but is said to have been descended from the Sharps of Little Norton, a family of great antiquity in Bradford Dale. In 1660 he was admitted of Christ's College, Cambridge; in July, 1667, he was ordained deacon and priest; and in October of the same year he became domestic chaplain to Sir Heneage Finch (then attorney-general, afterwards chancellor), and tutor to his sons. Having taken his master's degree at Oxford in 1669, he was in 1672, on the recommendation of Finch, nominated by the crown to the archdeaconry of Berkshire. When Finch was appointed the same year lord-keeper, he devolved the exercise of his church patronage upon Sharp, 'whose conscience,' says Nelson, in his *Life of Dr. Bull*, 'he charged with an impartial scrutiny in this matter; adding withal, that he would prefer none but those who came recommended from him; and that if he led him wrong, the blame should fall upon his own soul.' In 1676 Sharp was installed a prebendary of Norwich; and in 1677 he was instituted to the rectory of St. Giles in the Fields, London, on which he ceased to reside with his patron the chancellor, and took a house for himself. In 1679 he commenced D.D. at Cambridge, and that year also he accepted the lectureship at St. Lawrence, Jewry, which he held till 1683. In 1681 he was made dean of Norwich, an appointment for which he was again indebted to the interest of his steady friend the chancellor.

Having been chaplain to Charles II., he was re-appointed to the same office on the accession of James II., but gave great offence and involved himself in some trouble by a sermon which he soon after preached in his own church against popery. Sharp seems to have had no intention of provoking the royal displeasure; his sermon was preached in reply to a written argument in support of the right of the Church of Rome to the style and title of the only visible catholic church, which had been put into his hands as he was descending from the pulpit on the preceding Sunday; and he showed every disposition to make up for any offence he might have given. On the 14th of June, 1686, James addressed a letter to Compton, bishop of London, in which he observed, that notwithstanding the late royal letter to the two archbishops, and the directions concerning preachers issued on the 15th of March, 1685, yet Sharp had in some of the sermons he had since preached 'presumed to make unbecoming reflections, and to utter such expressions as were not fit or proper for him;' 'endeavouring thereby,' continued his majesty, 'to beget in the minds of his hearers an evil opinion of us and our government, by insinuating fears and jealousies, to dispose them to discontent, and to lead them into disobedience and rebellion.' And the bishop was commanded immediately to suspend Sharp from further preaching within the diocese of London, until he should have given satisfaction to his majesty, and his majesty's further pleasure should be known. Compton replied, that he should always count it his duty to obey the king in whatever he could perform with a safe conscience; but that in this case he humbly conceived he was obliged to proceed according to law, and therefore it was impossible for him to comply. His lordship however advised Sharp to abstain in the meantime from preaching; and on the 20th of June Sharp himself proceeded to Windsor with a petition to the king, in which he assured his majesty, that so far had he always been from venting in the pulpit anything tending to schism or faction, or any way to the disturbance of his majesty's government, that he had upon all occasions in his sermons, to the utmost of his power, set himself against all sorts of doctrines and principles that looked that way. 'But,' the petition went on, 'if in any sermon of his any words or expressions have unwarily slipped from him, that have been capable of such constructions as to give your majesty cause of offence, as he solemnly professes he had no ill intention in those words or expressions, so he is very sorry for them, and resolves for the future to be so careful in the discharge of his duty, that your majesty shall have reason to believe him to be your most faithful subject. And therefore he earnestly prayeth that your majesty, out of your royal grace and clemency, would be pleased to lay aside the displeasure you have conceived against your humble petitioner, and restore him to that favour which the rest of the clergy enjoy under your majesty's gracious government.' James would not even hear this petition read; upon which Sharp left town and went down to Norwich, where he amused his leisure in collecting old British, Saxon, and English coins, till at length, in the beginning of January, 1687, a letter from Sunderland informed him that he might return to his function. Kennet, in his 'Complete History,' says that he was indebted for his recal to the intercession of Pepys (the author of the 'Diary'), who was applied to 'as a good-natured man, with wife and children,' and who 'went freely to the king, and prevailed with his majesty' to remit his displeasure.

In August, 1688, Sharp drew up the reasons on which the other archdeacons and himself declined to appear before the ecclesiastical commissioners to answer for not obeying the king's orders in regard to the reading of the declaration for liberty of conscience. On the 27th of January, 1689, he preached before the Prince of Orange, and on the 30th before the Convention; on both occasions praying for King James, although on the 28th the Commons had voted that the king had abdicated and that the throne was vacant. It was not till after a long debate that the House agreed to thank him for his sermon, and to request that he would print it; and he thought it best to decline complying with that request. After the settlement of the new government, Sharp was, in September, 1689, promoted to the deanery of Canterbury, on the removal of Tillotson to that of St. Paul's. He was pressed to accept the place of one of the deprived bishops; but this his feelings would not allow him to do, and he ran some risk of losing the favour of King William, till his friend Tillotson put it into his head to offer to accept the archbishopric of York, on the pretext that such an arrangement would place him in his native district, as soon as it should become vacant by the death of Lamplugh, who was then very ill. He died, in fact, within a fortnight after, and Sharp was consecrated archbishop on the 5th of July, 1691. Sharp acquired a very high character in this eminent office, which he retained till his death, at Bath, on the 2nd of February, 1714. He enjoyed considerable influence at court during the reign of Anne, and, among other things, is said to have had a share in preventing the elevation of Swift to the Episcopal bench. As a preacher he had a clear, easy, correct style; and his sermons, which make seven octavo volumes, only one of which however appeared during his lifetime, have been repeatedly printed. The last edition was published at Oxford in 1840. Mr. Speaker Onslow, in a note to Burnet's 'History of his Own Times,' says of Archbishop Sharp, 'He was a great reader of Shakspeare. Doctor Mangey, who had married his daughter, told me that he used to recommend to young divines the reading of the Scriptures and Shakspeare. And Doctor Lisle, bishop of Norwich, who had been chaplain at Lambeth to Archbishop Wade, told me that it was often related there, that Sharp should say that the Bible and Shakspeare made him archbishop of York.' The 'Life of Archbishop Sharp,' by his son, Dr. Thomas Sharp, archdeacon of Northumberland, which had been in the hands of the compilers of the 'Biographia Britannica,' was published at London in 2 vols. 8vo. in 1829.

SHARP, ABRAHAM, an ingenious mechanist and a laborious calculator, was born at Little Horton, near Bradford in Yorkshire, in the year 1651. After having received the best education which a country school afforded, he was placed as an apprentice with a merchant or tradesman at Manchester; but feeling little inclination for commerce, and being strongly disposed to scientific pursuits, he prevailed on his master to cancel his indentures before the term of his service was expired. He then established himself at Liverpool, and there, while in order to obtain the means of subsistence he kept a school for the instruction of persons in humble life, he applied himself to the study of mathematics, particularly of astronomy, and to the formation of instruments for purposes connected with the sciences. It is probable that the school was soon given up, for Ramsden, the celebrated optician, who was his grand-nephew, relates that in his youth he held the post of an exciseman, and that he quitted that employment on obtaining possession of a small patrimonial estate.

Being thus enabled to consult his own taste in the choice of an occupation, Sharp came to London, where he at first hired himself as a book-keeper to a merchant; but having procured an introduction to Flamstead, this astronomer engaged him, in August, 1688, in mounting the instruments which had been provided for the Royal Observatory at Greenwich. He afterwards constructed and graduated for the observatory a mural sector whose radius was six feet seven inches and a half, and whose arc contained 140 degrees: the degrees were subdivided by means of diagonal lines, according to the method in use at that time, and by a micrometer screw; and Flamstead states, in the prolegomena to his 'Historia Cœlestis,' that the zenith point was determined by observing the zenith distances of stars with the instrument in direct and in reversed positions: in order to accomplish the reversion, it was made capable of being placed alternately on the eastern and on the western side of the wall. Sharp also assisted his friend in observing the right-ascensions and declinations of the sun, moon, and planets, and in forming the famous catalogue (the British) of 2884 fixed stars.

Finding that frequent exposure to the cold air by night injured his health, he resigned his post at the Royal Observatory, and retired to his native town, where, on his recovery, he fitted up an observatory for himself, for which, with his own hands, he formed the lenses of the telescopes and graduated the arcs of the instruments for measuring angles. Sharp is considered by Smeaton as the first who brought hand-graduation far on the way to perfection:

the art was subsequently improved by Smeaton and Bird, but it has since been superseded by the use of dividing-engines, the invention of which is due to Ramsden.

It is however as an accurate calculator that Sharp is particularly distinguished: after his retirement to Horton, he continued to assist Flamstead in his labours, and he computed for him most of the tables in the second volume of the 'Historia Cœlestis:' he was also employed frequently in making intricate calculations for Sir Jonas Moore, Dr. Halloy, and other mathematicians. In 1717 he published a treatise, in 4to., entitled 'Geometry Improved,' which contains an extensive and accurate table of circular segments, with an account of its use in the solution of problems; also a table of the logarithms of numbers from 1 to 100, and of the primo numbers to 1100 (all computed to the extent of sixty-one decimal places), together with subsidiary tables to be used in forming from them the logarithms of other numbers. The process of computing logarithms was then far more laborious than it would be now, the formulæ by which the operations may be greatly facilitated not having been discovered; and it is worthy of remark, that those formulæ were not known till after the labour which they would have spared had been undergone. Their utility for the purposes of computation consists thorefore chiefly in their being the means by which the numbers given in the earliest tables may easily be verified.

Mr. Sharp calculated, besides, a table of natural and logarithmic sines, tangents, and secants to every second in the first minute of a degree; and he determined to seventy-four places of decimals the length of the circumference of a circle by means of the series expressing that of an arc in terms of its tangent, which had been discovered by James Gregory in 1671. The series, when the arc = 30°, gives (after being multiplied by 6) for the length of the half-circumference, when the semidiameter is equal to unity,

$$2\sqrt{3}\left\{1-\frac{1}{3.3}+\frac{1}{5.3^2}-\frac{1}{7.3^3}+\&c.\right\};$$

and in this state it was employed by Mr. Sharp, who underwent the immense labour of computing the values, and taking the sum of 150 of the terms within the braces, besides that of extracting the square root of 3 to 76 decimal places.

The health of this ingenious man had always been delicate; and after he quitted London, he lived in a very retired manner, receiving only the occasional visits of two friends from Bradford; even his servant had seldom access to him, and the food for his meals was placed, through a hole in the wall, in a closet adjoining his study. It is stated that often during a whole day, when deeply engaged in calculations, he took no refreshment; yet he found time to keep up an extensive correspondence with the great mathematicians of that age, and he regularly attended the services of religion at a chapel for dissenters in tho town. He was never married, and he died, July 18, 1742, at the age of ninety-one years.

SHARP, GRANVILLE, was the son of Dr. Thomas Sharp, who held a prebend in Durham cathedral and was archdeacon of Northumberland. Dr. Thomas Sharp was the author of several works, philological, antiquarian, and religious, which were collected and published in 6 vols., 8vo. London, 1763. He was born about 1693, and died in 1758.

Granville Sharp was born in 1734. He was educated for the bar, but he never practised, and quitted the study of the law for a situation in the ordnance-office, which however he resigned on the breaking out of the American war, being opposed to those principles and measures of the British government which led to that war. He then took chambers in the Temple, with the intention of pursuing his studies as a private gentleman.

Granville Sharp, though a man of considerable literary acquirements, and the author of several works in philology, law, theology, and politics, is chiefly known for the boldness, the ability, and the effect with which he stood forward as the opponent of negro slavery. In 1769 he published 'A Representation of the Injustice and Dangerous Tendency of Tolerating Slavery in England; with Remarks on the Opinions given in 1729 by the then Attorney and Solicitor General,' London, 8vo., with an appendix, 1772. His conduct however in a case of individual oppression first brought him conspicuously before the public. A negro of the name of Somerset had been brought to London, and falling ill, was turned out of doors by his master. Sharp found him in the street in a state of the utmost destitution, and took him to St. Bartholomew's Hospital, where he was restored to health, and Sharp then procured him a situation as a servant. About two years afterwards Somerset was arrested by his old master, and imprisoned in the Poultry Compter as a runaway slave. Somerset applied to his former friend Sharp, who brought the case before the lord mayor, by whom it was decided that Somerset should be set at liberty. The master however, in defiance of this decision, seized Somerset in the presence of the lord mayor and of Sharp, and insisted upon his right to his slave. Sharp then brought an action against the master for assault; the case was tried, and was finally referred as a question of law to the twelve judges; it was argued at three sittings, in January, in February, and in May, 1772, and by an unanimous decision the law of England was declared to be that as soon as a slave sets foot on English territory he becomes free.

'Slaves cannot breathe in England: if their lungs
Receive our air, that moment they are free.
They touch our country, and their fetters fall.'

Sharp continued to exert himself in behalf of the negroes. He wrote four pamphlets against slavery in 1776. At length the Association for the Abolition of Negro Slavery was formed, the first meeting of which was hold in London, on the 22nd of May, 1787, when Granville Sharp was appointed chairman of the twelve persons of whom it consisted, most of whom wero London merchants, and all but two were quakers. In this great cause Sharp continued to labour, as well as in others favourable to popular rights and political freedom. He was opposed to the impressment of seamen, and a citizen of London having been seized and carried to the Nore, Sharp had him brought back by a writ of habeas corpus from the Court of King's Bench, and he was set at liberty. He sent out a number of negroes whom he found in the streets of London to Sierra Leone at his own expense, and also drew up a 'Sketch of Temporary Resolutions for the intended Settlement on the Grain Coast of Africa, near Sierra Leone,' and thus may be said to have been the founder of the settlement there. He was an advocate of parliamentary reform, having, as early as 1778, published 'A Declaration of the People's Natural Rights to a Share in the Legislature, which is the fundamental Principle of the British Constitution of State; also a Declaration of Defence of the same Doctrine, when applied particularly to the People of Ireland,' London, 8vo.

Granville Sharp continued to pass his time in those and similar benevolent labours till July, 1813, when he died at the age of 79.

Sharp's writings were numerous, and had many readers at the time when they appeared, but as most of them are pamphlets, and were written for temporary purposes, they are not much referred to now. Among them howover are some laborious and useful investigations into the great principles of the English constitution, particularly his 'Account of the Ancient Divisions of the English Nation into Hundreds and Tithings,' London, 1784, 8vo., and his 'Account of the English Polity of Congregational Courts, more particularly of the great Annual Court of the People, called Frank Pledge,' London, 1786, 8vo. He was a zealous member of the established church, and had a great dislike to the Roman Catholic religion, but was liberal to Protestant Dissentors of all classes.

(*Memoirs of Granville Sharp, Esq., composed from his own Manuscripts and other authentic Documents*, 1820, 4to.)

SHARP, WILLIAM, an eminent engraver in the line manner, was born on the 29th of January, 1749, in Haydon Yard in the Minories, where his father carried on the business of a gun-maker. He was early apprenticed to an engraver of plates, door-plates, and other such articles, being what is termed a bright engraver. At the expiration of his indentures, Sharp married a French woman, and commenced business in the same line in Bartholomew Lane; but he soon exercised his talent in the higher branches of the art. His earliest effort was an engraving of the old lion Hector in the Tower of London, from an original drawing by himself. In 1782 he sold his shop, and removed to a private house in Vauxhall, where he began to engrave from pictures by the old masters; and soon after he was engaged, in conjunction with Angus, Heath, and Collyer, in decorating the 'Novelist's Magazine' with plates after the designs of Stothard. Here he also completed the Landing of Charles II., after West, a work which Woollett had left unfinished; and he engraved some plates for Cook's 'Voyages;' and a beautiful oval work, after Bennall, of the Children in the Wood. The profits of his professional employment and a legacy enabled Sharp to take a larger house, and he accordingly removed to Charles Street, Middlesex Hospital. In 1814, when enjoying his highest reputation, he was elected a member of the Imperial Academy of Vienna, and of the Royal Academy of Munich. Sir Joshua Reynolds offered to propose him as an associate of the Royal Academy of London; but Sharp, coinciding in opinion with Woollett, Hall, and other engravers, that the art was slighted by the rule which precludes the election of its professors to the rank of academician, declined the proferred compliment. From London he went to reside at Acton, and finally at Chiswick, where he died of dropsy in the chest, on the 25th July, 1824. Amongst the many works of this eminent engraver may be enumerated the Doctors Disputing on the Immaculateness of the Virgin, and the Ecce Homo after Guido; St. Cecilia, after Domenichino; the Virgin and Child, after Carlo Dolci; Diogenes, after Salvator Rosa; the Sortie from Gibraltar, after Trumbull; the Destruction of the Floating Battery at Gibraltar, after Copley; and the portrait of John Hunter, after Sir Joshua Reynolds. The last engraving is considered to be one of the finest specimens of the art. He also engraved, in some instances, figures in the landscape plates of other persons. As an instance of this may be mentioned the group of Niobe in the print by Samuel Smith, after the original picture by Wilson, now in the National Gallery, a group which is justly considered superior to that from the hand of the painter.

Mr. Sharp, though in the ordinary transactions of life a man of shrewdness, was, in matters of science and religion, a visionary and an enthusiast. No imposture was too gross for his belief, and no evidence sufficiently strong to disabuse his mind. The doctrines of Mesmer, the rhapsodies of the notorious Richard Brothers, and the still more disgusting exhibitions of Johanna Southcott, in turn found in him a warm disciple; and, in the last case, an easy and liberal dupe. By that impostor and her confederates, Mr. Sharp was swindled out of the bulk of his savings, under the delusion that he was purchasing estates in the New Jerusalem. So confident was he of her divine mission, that although she died several years before him, he believed, up to the hour of his own dissolution, that she was only in a trance. In the case of Brothers, he had so strong an opinion of his prophetic powers, that he engraved two plates of his portrait, lest one should not be sufficient to produce the requisite number of impressions which would be called for on the arrival of the predicted Millenium. Upon these plates he inscribed, 'Fully believing this to be the man appointed by God, I engrave his likeness. W. Sharp.' [BROTHERS.]

The general style of Sharp's engraving was formed from a judicious selection of the merits of all his eminent predecessors and contemporaries, from none of whom he servilely borrowed, but improved upon all by a comparison of their works with nature. The half-tints and shadows of his best engravings are peculiarly rich; and his lines combine, with the utmost freedom, a regularity and accuracy of position rarely attained without mechanical aid. In no quality of his art was he more distinguished than in the power which he possessed of imitating the various textures of the different parts of his subject, a circumstance which is most obvious in a fine impression of the portrait of John Hunter before alluded to. (*Annual Biography and Obituary*, &c.)

SHAW, THOMAS, was born at Kendal, in Westmoreland, about the year 1692. He entered at Queen's college, Oxford, where took the degree of master of arts in 1719; and, after receiving holy orders, was appointed chaplain to the English factory at Algiers. He held this post for twelve years, and did not return to England until 1734. During his absence he was chosen a fellow of his college. In 1734 he took the degree of D.D., and was elected a fellow of the Royal Society. In 1738 he published the first edition of his travels, and presented his collection of natural curiosities and antient medals and busts, which he had formed when abroad, to the university of Oxford. On the death of Dr. Felton, his college nominated him principal of St. Edmund's Hall, and at the same time he was presented to the living of Bramley, in Hants. He likewise held the chair of the regius professorship of Greek in the university until his death, which took place in 1751.

The travels of Shaw extended through countries, some of which were previously little known. He traversed the whole of antient Numidia, and visited Syria, Palestine, and the north of Egypt. His geographical details are exact and very valuable, since they furnish us with information concerning the antient and modern condition of Numidia, and Mauritania Cæsariensis. His descriptions of manners and customs are very interesting, and he appears to have neglected nothing which could enhance the value of his work. In a supplement to his travels he published an account of 600 plants which he had collected; 140 of which were previously unknown to botanists. His extreme accuracy and strict adherence to truth, form one of his chief merits, and to this Bruce bears abundant testimony.

The best edition of his travels was published in 1757, six years after his death, in one volume, quarto, which contains various maps and plates, and the supplement.

SHAW, CUTHBERT, was born in 1738 at Ravensworth in Yorkshire. He was the son of a shoemaker, but received a good education, and became usher in a school at Darlington in Yorkshire. He afterwards came to London, and was for some time an actor, but abandoned the profession for that of an author. He contributed to the periodical literature of the day, and also wrote 'Liberty, a Poem,' 1756, 4to.; 'Odes on the Four Seasons,' Lond., 1760, 4to., published under the name of W. Seymour; 'The Four Farthing Candles, 1762, 4to.; 'The Race, 1766, 4to. (the two last are satires directed against contemporary writers); 'A Monody to the Memory of a Young Lady who died in Childbed, to which is added An Evening Address to a Nightingale, by an Afflicted Husband,' Lond., 1768, 1772, 4to.; 'Corruption, a Satire,' 1769, 4to. Shaw died at London in 1771, at the early age of thirty-three, of a disease occasioned by his dissipated habits. The 'Monody' and 'Address to the Nightingale' are sometimes met with in collections of English poetry, and show that the author had some skill in versification, but little else.

SHAW, GEORGE, the younger son of the Rev. Timothy Shaw, was born at his father's vicarage at Bierton, in Buckinghamshire, on the 10th of December, 1751.

During his childhood he discovered great fondness for the study of natural history; in the cultivation of which science he afterwards attained great distinction. His energies however were not engrossed by that subject, but his talent for the acquisition of all kinds of learning was so great, that when only thirteen years old, he was fully qualified to enter at the university. He was admitted at Magdalen Hall, Oxford, in 1765, where he took his bachelor's degree in [illegible], and that of master of arts in 1772. In 1774 he took deacon's orders, and during a short time discharged his clerical duties at two chapelries connected with Bierton.

An increasing love for the cultivation of natural science induced him to repair to Edinburgh, in order to pursue his favourite studies. He continued at Edinburgh for three years, where he studied medicine under Black and Cullen, and afterwards returning to Oxford, obtained the appointment of deputy botanical lecturer. In the discharge of the duties of that office he obtained a high reputation, and on the death of Dr. Sibthorp, was chosen professor of botany in his stead. It was discovered however that by an old statute of the university clergymen were declared ineligible for the office, and Dr. Shaw consequently lost the appointment.

In the autumn of 1787 he took the degree of doctor of medicine, and in the course of the same year removed to London, where he settled as a physician. On the formation of the Linnæan Society, in 1788, Dr. Shaw was appointed one of the vice-presidents, and he afterwards enriched its transactions with many valuable papers. He now began to deliver public lectures at the Leverian Museum, which were always attended by a numerous audience. Nor was he less popular as a writer than as a lecturer, and a periodical entitled the 'Naturalist's Miscellany,' which he now set on foot, was continued till his death. In 1789 he was chosen a fellow of the Royal Society, and it was not long before he gave up the practice of his profession and devoted himself exclusively to scientific pursuits. In 1791 the occurrence of a vacancy at the British Museum induced Dr. Shaw to become a candidate for the office of a librarian, and on his receiving the appointment of assistant keeper of natural history in that institution, he entirely gave up medical practice. His time during the last twenty years of his life was occupied with lecturing on natural history, publishing works on scientific subjects, and editing conjointly with Dr. Hutton and Dr. R. Pearson 'An Abridgment of the Philosophical Transactions.' On the death of Dr. Gray he was appointed keeper of the natural history in the British Museum, which office he held during the remaining six years of his life. In the midst of his useful labours however he was attacked by an illness which terminated fatally in the course of a few days, on July 22, 1813.

Dr. Shaw, at the time of his death, was in his sixty-second year. He was as much beloved for his moral qualities, as respected for his intellectual acquirements, which were of a very high order.

His principal works are: 'The Naturalist's Miscellany,' which had reached its 286th number when he died; 'A Catalogue of the Leverian Museum, illustrated with Coloured Plates,' which appeared between 1792 and 1796; and his well known systematic work on 'Zoology.' He furnished the letter-press to a very magnificent work, containing sixty beautiful prints of plants and animals, which Miller, the editor of the 'Gardener's Dictionary,' had published, but which, from the want of an accurate description of the plates, had not met with a ready sale. The most useful of his works however was his 'General Zoology, or Natural History.' This appeared in parts, and eight volumes were published during the lifetime of the author, who left a ninth volume prepared for the press. After Dr. Shaw's death the work was continued by Mr. Stevens, and now forms fourteen octavo volumes.

SHAWER, originally a Mamluke in the house of the vizier of Egypt, Talai-Ebn-Razik, by whom he was appointed governor of the Saïd. The attempt however of Razik-al-Adel, son and successor of his benefactor, to remove him from this province, led to a civil war, in which Razik was slain; and Shawer compelled the helpless Fatimite khalif, Adhed, to appoint him vizier and commander-in-chief, A.D. 1162, A.H. 558. He was however expelled in a few months by another chief named Dargham, and fled into Syria to the sultan, Noor-ed-deen [NOUREDDIN], whom he persuaded, by a promise of a third of the revenues of Egypt, to send a force under Shîrakoh [SHIRAKOH] to reinstate him; but he broke his engagement when the service was fulfilled, and called in a French army from Palestine, which drove Shîrakoh out of Egypt. A second invasion by the troops of Noor-ed-deen (1166), who was now converted into an enemy, was repulsed by the same aid. But the Christians in their turn threatened to seize on the country, and Shawer was compelled to throw himself on the mercy of the sultan for help. Shîrakoh a third time entered Egypt (1168), and expelled the Franks; but becoming suspicious of the good faith of Shawer, soon seized him and put him to death, himself assuming the vacant dignity of vizier. The fall of the Fatimite dynasty followed within three years. [SALAH-ED-DEEN.]

SHEA-TREE. [BASSIA.]

SHEARWATER. [PETRELS, vol. xviii., p. 41.]

SHEBA. [SABAEI.]

SHEEN. [SURREY.]

SHEEP. The Sheep, according to Cuvier, belongs to the class *mammalia*, the young being nourished with milk from the mammæ or teats of its mother; to the order *ruminantia*, with four stomachs, and the organs of digestion disposed for chewing the cud; to the tribe *capridæ*, with horns persistent, and placed on an osseous nucleus; and to the genus *ovis*, with or without horns, but these when present uniformly taking, to a greater or less degree, a lateral and spiral direction. The forehead of the sheep is arched, and protruded before the base of the horns; there are no lachrymal ducts, the nostrils are lengthened and oblique, and terminate without a muzzle; there is no beard properly so called, the ears are small, and the legs slender. The hair is of two kinds, one hard and close, and the other woolly—the wool preponderating in proportion as the animal is domesticated. The sheep is principally distinguished from the goat by his convex forehead, by his spiral horn not projecting posteriorly, and more especially, and that in proportion to the care which is bestowed upon him, by the preponderance of wool over the hair, with which, in despite of every effort, the Cashmere goat is covered.

The history of the sheep may be traced to the remotest antiquity, for the care of it was committed to the younger son of the first man. 'Abel was a keeper of sheep.' What other animals were then domesticated is not known; but one purpose to which the sheep was devoted is recorded in the sacred volume: 'Abel brought as an offering to the Lord the firstlings of his flock, and the fat thereof.' Not a word is said of this animal being used for human food until after the flood. Man ate of 'the herb of the field,'—'in the sweat of his face he ate bread;' but to Noah it was first said, that 'every thing that liveth shall be meat for him.' The probability however is, that the flesh of the sheep and other animals formed, even in the earliest period, a portion of human food; and it is recorded of Jubal, a son of Cain, that he 'was the father of such as dwell in tents and have cattle.' The tents were formed of the skins of the animals which they bred; and it can scarcely be imagined, that when the skins were thus disposed of, the flesh would be entirely thrown away. The sheep mentioned in holy writ were horned; for when Abraham had led his son Isaac to the mount of sacrifice, he was arrested by a heavenly voice, and saw behind him a ram caught in a thicket by his horns.

There is a breed of sheep now extending over the north and south of Asia, and Palestine, and Russia, and of which the flocks of the Calmucks and Tartars of the present day are almost entirely composed. They are distinguished by two hemispheres of fat commencing at the loins, gradually swelling into a considerable mass towards the rump, and presenting behind two enlargements of a more or less globular form. The owners of the modern improved breeds would find great fault with some points about them; but many of their defects have doubtless been the result of neglect.

Some naturalists have traced the origin of the sheep to the Argali or the Mouflon. The Argali is a species of mountain-sheep, found in small flocks on the high grounds of Asia, extending from the precipices of Khamtchatka in the north, to those of Mongolia in the centre, and of Caucasus in Western Asia. The Mouflon is an inhabitant of Southern Europe, Corsica, Crete, and the islands of the Grecian archipelago. They congregate in large groups, and possess all the wildness of the Argali. Neither of these however has the slightest claim to being the original parent of the sheep. They are descendants of those who have escaped from the dominion of man, and are retreating from desert to desert in proportion as the population of the country increases.

Mouflon, or Musman, of Corsica. From a specimen in the British Museum.

It will be most satisfactory to the reader to commence with the history of the British sheep, and then compare with them the breeds and management in other countries. The records of olden times are very unsatisfactory with regard to the existence of the sheep in Britain. No early historian makes the slightest mention of them. Even Cæsar, who describes so much at length the employments and habits of the British, never alludes in the most distant manner to the sheep, or the employment of its wool. The subjugation however of Britain being completed, the conquerors turned their attention to the improvement of the country; and among other things they established a woollen manufactory at Winchester, supplied by the native fleeces of the country, for from no other source could it be obtained. So well did this succeed, that the woollen cloths of Britain soon began to vie with and excell the productions of every other part of the Roman empire. The finest and most expensive dresses used on days of festivity or ceremony were procured from Britain. The sheep employed in furnishing the material of these productions were *the short-woolled breed.* Winchester was situated in the centre of a country which then, as now, could support short-woolled sheep alone.

After this, history is silent as to the sheep and its productions for some centuries, until an old chronicler gives a pleasing picture of the manners of the age when Alfred reigned, of whom it is said—

> 'His godmother ofte smal gyftes to him she kindly toke
> Vor to leve other plé, and loke upon his boke.

This godmother is described as being skilled in the spinning of wool herself, and busied in training her daughters to the same employment.

It would appear from this that *the long wool* had now begun to be employed, although the manufactures of the Winchester mills continued to be duly estimated, and, in point of fact, the cultivation of the various breeds of sheep, and the manufacture of the fleece into many different kinds of cloth, had begun to constitute the chief employment and wealth of the country; and so it has continued to the present day.

Different names are given to the sheep, according to its sex and age. The male is called a *ram* or *tup.* After weaning he is said to be a *hog*, a *hogget*, or *hoggerel*, a *lamb-hog*, or *tup-hog*, or *teg*; and if castrated, a *wether hog*. After shearing, and when he is probably a year or a year and a half old, he is called a *shear hog*, or *shearling*, or *dinmont*, or *tup;* and when castrated, a *shearing wether*. After the second shearing, he is a *two shear ram*, or *tup*, or *wether*. At the expiration of another year, he is a *three-sheer ram*, &c.

The female is a *ewe* or *gimmer lamb* until weaned, and then a *gimmer* or *ewe hog* or *teg*. After being shorn, she is a *shearing ewe* or *gimmer*, or *theave* or double-toothed ewe; and after that, a *two* or *three* or *four shear ewe or theave*. The age of the sheep is reckoned, not from the period of their being dropped, but from the first shearing.

The teeth give certain indications as to the age. The sheep has no incisor teeth in the upper jaw; but there is a dense elastic cushion or pad, and the herbage, firmly held between the front teeth in the lower jaw and this cushion, is partly bitten and partly torn asunder. The sheep has the whole of the incisor teeth by the time that he is a month old, and he retains them until the fourteenth or sixteenth month. They then begin to diminish in size, and are displaced. The two central ones are first shed, and the permanent ones supply their place, and attain their full growth when the animal is two years old. Between two and three, the next pair are changed; the third at three years old; and at four, the mouth is complete. After this there is no certain rule, until, two years more having passed, the teeth one by one become loosened and are lost. At six or seven years of age the mouths of the ewes should be occasionally examined, and the loose teeth removed, and then, by good pasture and good nursing in the winter, they may produce lambs until they have reached the ninth or tenth year, when they begin rapidly to decline. Some favourites have lingered on to the fifteenth or sixteenth year; but the usual and the most profitable method is to fatten and dispose of the ewes when they are five or six years old, and to supply their places by some of the best shearing ewes.

The rings at the base of the horns afford very imperfect indications of the age of the sheep. When untouched, they are little to be depended upon, and their natural irregularities are too often filed away by dishonest dealers.

The history of the British sheep will be most naturally divided according to the quantity and quality of the wool of the different breeds, the uses of the skin, and the quantity and quality of the flesh. The covering of the original sheep consisted of a mixture of hair and wool; the wool being short and fine and forming an inner coat, and the hair of greater length, projecting through the wool, and constituting an external covering. When the sheep are neglected or exposed to a considerable degree of cold, this degeneracy is easily traced. On the Devonshire moors, the mountains of Wales, and the highlands of Scotland, the wool is deteriorated by a considerable admixture of hair. Even among the South Downs, the Leicesters, and the Ryelands, too many *kemps* occasionally lessen the value of the fleece. It is only by diligent cultivation that the quantity of hair has been generally diminished, and that of wool increased in our best breeds.

The filaments of wool taken from a healthy sheep present a beautifully polished and even glittering appearance. That of the neglected or half-starved animal exhibits a paler hue. This is one valuable indication by which the wool-stapler is enabled to form an accurate opinion of the value of the fleece. The mixture of hair in the wool can often be detected by close examination with the naked eye, but most readily by the assistance of a microscope.

Among the qualities which influence the value of the wool are *fineness*, and the uniformity of that fineness in the single fibre and in the collected fleece. This fineness however differs materially in different parts of the fleece. It prevails on the neck, the shoulders, the ribs, and the back. It is less on the legs, thighs, and haunch, and still coarser on the neck, the breast, the belly, and the lower part of the legs. The fineness of the wool is considerably influenced by the temperature. Sheep in a hot climate yield a comparatively coarse wool; in a cold climate, they carry a closer but a warmer fleece.

The fineness of the fleece is also much influenced by the kind of food. An abundance of nutriment will increase both the length and the bulk of the wool. This is an important consideration with the sheep-breeder. Let the cold of winter come—let it continue for a considerable period, yet if the sheep is well kept, although the fleece may lose a little weight, this will be more than compensated by its fineness and increase of value. If the sheep however is half-starved while he is exposed to unusual cold, the fibre of the wool, although perhaps somewhat finer, will be deficient in weight and strength and usefulness.

That which is called *trueness of staple*, or the fibres being of an equal size, is of much importance in the manufacture of wool, for whenever the wool assumes an irregular and shagged or *breachy* appearance, there is a weakness in the fibre and will be an irregularity in the manufacture, especially if the fleece is submitted to the operation of the comb. Connected with this, and a most important quality, is the *elasticity* of the woolly fibre—the disposition to yield, or submit to some elongation of substance, some alteration of form, when it is distended or pressed upon, and the energy by means of which the original form is resumed as soon as the external force is removed.

Referrible to this elasticity or yielding character of the wool is its *pliability* and *softness*, and without which no manufacture of it can be carried to any degree of perfection. The last quality which it is necessary to mention is its *felting* property, that quality by which it may be beaten or pressed together and worked into a soft and pliable substance of almost any size and form. It would seem that the process of felting is of far older date than that of weaving, and it is still continued not only by the nomadic tribes of south-eastern Europe and of Asia, but it is made occasionally to vie with the finest productions of the loom.

Some late microscopic observations have unravelled the whole mystery of felting, and of the employment of wool in almost every form. The fibre, examined under a powerful microscope, appears like a continuous vegetable growth, from which there are sprouting, and all tending one way, from the root to the other extremity, numerous leaves, assuming the appearance of calices or cups, and each terminating in a sharp point. It is easy to conceive how readily one of these fibres will move in a direction from the root to the point, while its retraction must be exceedingly difficult if not impossible. It was a fibre of Merino wool that was first submitted to microscopic observation, and the number of these serrations or projections counted. There were 2400 in the space of an inch. A fibre of Saxon wool finer than that of the Merino, and of acknowledged superior felting quality, was substituted. There were 2720 serrations. A fibre of South Down wool, in its felting power well known to be inferior to that of the Saxony and the Merino, was placed in the field of vision. There were only 2080 serrations in the space of an inch, or 640 less than the Saxony exhibited. The Leicester wool is acknowledged to possess a less felting property than the South Down. There were only 1860 in the space of an inch.

There can be no doubt as to the structure of the woolly fibre. It consists of a central stem or stalk, from which there spring at different distances circlets of leaf-shaped projections, possessing a certain degree of resistance or of entanglement with other fibres, in proportion as these circlets are multiplied and they project from the stalk. They are sharper and more numerous in the felting wools, and in proportion as the felting property exists. They are connected with, or, it may be confidently asserted, they give to the wool the power of felting, and regulate the degree in which that power is possessed.

The skin of the sheep is often partially tanned, and then used in the common sorts of book-binding; or it is manufactured into parchment, and becomes exceedingly valuable on account of its durability. Immense numbers of lambskins are dressed in a peculiar way, and converted into gloves with the wool remaining on them, or used in some countries for the linings of valuable garments. It is scarcely credible to what degree vanity and cruelty are sometimes carried. The ewe is slaughtered a little before the time when her pregnancy would have expired, and the lamb is taken from the womb and immediately destroyed. It is supposed that the fur nearest to the skin is more beautiful than could have been obtained from the same animal after birth.

As for the carcase of the sheep, it is comparatively lately that even in Great Britain it has been regarded in the light that it deserves. In many foreign countries it is disliked, or at least rarely eaten. The Calmucks and Cossacks seldom touch it. Even in some parts of America there is a prejudice against it. It is an object of little or no value in Spain; and, except among the poorest, it is not there considered fit for food. Since the British sheep-master has begun, and judiciously, to look more to the profit to be derived from the carcase—since the system of artificial feeding has been brought to so great perfection, and a far greater number of sheep can be fed and perfected on the same number of acres, perhaps the wool may have somewhat altered in character. It has grown in length, and it has increased in bulk of fibre. It has not deteriorated, but it has changed. If no longer fit for the purposes to which it was once devoted, it has become suited to others. The increase of the number of fleeces and the increase of weight in each fleece go far to compensate for the diminution of price, while the improvement of the carcase more than supplies the deficiency, if in truth there was any deficiency to supply.

It has been proved by authentic documents, that the number of sheep in the united kingdom has been more than trebled in the last 150 years. How was this managed? for it was supposed that no more than a given number of sheep could be kept on a certain space of ground. The quantity of ground was rapidly increased, and much that was formerly deemed unworthy of cultivation was rendered productive; but more effective than this was the new system of husbandry that was introduced—the artificial or turnip husbandry, by which a regular supply of food could be provided for every season. With this was connected the attempt to fatten sheep still more expeditiously than could be accomplished by any former method. This succeeding beyond his most sanguine expectations, the sheep-master next attempted to increase the size of the breed. He had not however sufficiently taken into account a consequence of this. As the carcase increased in size, the wool became longer, heavier, and coarser. The breeder would not see this at first; but he soon began to find that the manufacturer would not purchase it, for it could not be used for the purposes to which it was formerly applied. His stock accumulated. It weighed heavily on his hand. Still he would not believe that his once favourite and yet valuable wool was deteriorated, although he was compelled to sell it at a diminished price. And what was the consequence? Why that he had no just reason to complain; for the early maturity of the sheep and the continued value of the wool for many important purposes rendered his profits greater than they were before he had begun to alter his system.

It will now be proper to take a rapid survey of the different breeds of sheep, commencing with the *South Downs;* for by them or their congeners the first manufactory at Winchester was supported. The South Downs, and the Hampshire and Wiltshire breeds, were formerly, according to Mr. Ellman, of 'a very small size, and far from possessing a good shape, being long and thin in the neck, high on the shoulders, low behind, low on the loins and on the rumps, the tail set very low, perpendicular from the hip-bones, sharp on the back, the ribs flat but good in the leg, although having big bones.'

It is pleasing to compare this with the account given by the same breeder of the South Downs of the present day—the change being effected by him and a few spirited individuals. 'The head small and hornless; the face speckled or grey, and neither too long nor too short; the lips thin, and the spaces between the nose and the eyes narrow; the under-jaw fine and thin; the ears tolerably wide, and well covered with wool; the forehead also, and the whole space between the ears well protected by it, as a defence against the fly.

'The eyes full and bright, but not prominent; the portion of the frontal bone arching the eye not too prominent, that it may not form a fatal obstacle in lambing.

'The neck of a medium length, thin towards the head, but enlarging towards the shoulders, where it should be broad and high, and straight in its whole course above and below; the chest wide, deep, and projecting between the fore-legs, indicating a good constitution and a disposition to thrive. The shoulders on a level with the back, and not too wide above, but bowing outward from the top to the breast, leaving room for the springing rib behind.

'The ribs coming out horizontally from the spine, extending far backwards, and the last rib projecting more than the others. The back flat from the shoulders to the setting on of the tail; the loin broad and flat; the rump long and broad, and the tail set on high, and nearly on a level with the spine; the hips wide; the space between them and the last rib on either side as narrow as possible, and the ribs presenting a circular form like a barrel.

'The belly as straight as the back.

'The legs neither too long nor too short; the fore-legs straight from the breast to the foot, not bending inward at the knee, and standing far apart both before and behind; the hocks having a direction outwards, and the meeting of the thighs being particularly full; the bones fine, but having no appearance of weakness; and the legs of a speckled dark colour.

'The belly well defended with wool, and the wool coming down before and behind to the knee and to the hock; the wool short, close, curled, and free from spiry projecting hairs.

'The South Down is adapted to almost any situation in the midland part of England. It has a patience of occasional short keep, and an endurance of hard stocking equal to any other sheep; an early maturity scarcely inferior to the Leicesters, and the flesh finely grained, and of good flavour.'

These sheep occupy the whole of the upper and under-hill grounds of Sussex. Mr. Luccock calculated that within a certain distance from the downs, there were 864,000 sheep of this breed, a number which is only to be accounted for by the great quantity of artificial food that is raised on the arable part of every farm. It has often been attempted to introduce the Leicesters into the neighbourhood of the South Downs, but they could not be driven two or three miles twice every day from the pasture to the fold, and the fold to the pasture.

According to Mr. Ellman, the articial food resorted to at the beginning of spring, and soon after lambing, is green rye; but it must be very cautiously given, on account of its occasionally producing diarrhœa or dysentery. This bad effect however may be prevented by removing the ewes once in the day to old pasture-ground.

The rye being fed off or running to seed, the ground is ploughed in May for turnips or rape. Rye grass succeeds to the rye until the latter end of June, when the winter tares will come in, and which should be sown from the beginning of October to that of May, in order that one crop may follow another in proportion as it is wanted.

Tares, clover, or rape next take their turn; the tares perhaps are somewhat inferior to the others. As a winter food, the Swedish turnip comes in until lambing time; but not after that, lest it should produce purging in the lambs.

About the middle of October the rams are admitted to the ewes, and a plentiful allowance of nutritious and stimulating food will have considerable influence in increasing the number of lambs. Much to the credit of the breeder, great care is taken of the sheep during the lambing time. The ewes are either driven home, or there are sheltered places constructed in the fields.

The average dead-weight of the South Down wether varies from 8 to 11 stones; but at the Christmas show there are usually some pens in which the weight is double that. The average weight of the fleece used to be 2 lbs.; but from the altered system of management it is now at least 3 lbs. in the hill-sheep, and nearly 4 lbs. in the lowland-sheep. This wool has likewise changed its character. It has become a combing instead of a carding wool. Formerly devoted to the manufacture of servants' and army clothing, or being sparingly mixed with other wool, it is now used for flannels and baizes, and worsted goods of almost every description, thus becoming of considerably increased value. The hogget wool is particularly improved; it is finer than the other long wools, and is applicable to many new and valuablu purposes.

The South Down sheep have succeeded admirably in all the southern districts of the kingdom; but the northern hills have occasionally been too cold for them. Crosses between the South Down and almost every breed of middle-wool sheep have answered well; while in counties where it could have been least expected, thu old breed is in a great measure superseded by the South Downs.

In the adjoining county of Kent many South Downs are kept, and much prized; but in others, and on the marshes and their neighbourhood, they have given way to the Romney Marsh sheep.

The South Down differ materially in tho different districts of Surrey. In some of the lofty and barren heaths a small and profitable sheep, distinguished by the name of 'the Bagshot,' still prevails. 'The old Wiltshire sheep' are occasionally seen here, while 'the Dorsets' have possessed themselves of many extensive districts, and are employed in supplying the London market with early lambs. Still however the South Downs are numerous, and vie with any of the others in excellence and profit.

The old Berkshire breed is now rarely seen; the South Downs have usurped their place, and especially in the chalky districts. In Hampshire we can imagine that we recognize some of the old and valuable breed that supplied the Winchester manufactory. They are in a great measure the South Downs of the present day, or are very deeply crossed by them. The West Counties Down sheep is an importation from some of the western counties, particularly from Somersetshire; but it is gradually yielding to the South Downs.

The old Wiltshire breed of sheep, the largest and the heaviest of the fine-woolled sheep, has gradually passed away. They were crossed by the South Downs until every trace of tho old breed had vanished, and a useful variety remained, which would have been called true Sussex sheep, only they were of a somewhat larger size, and lighter colour, and a lighter finer fleece. This breed is now rapidly yielding to the true South Downs. In the lower-land pastures of Wilts a breed is found evidently derived from the South Downs, but larger in size, and with a heavier fleece.

We pass into Dorsetshire, and we find a very different and valuable breed of sheep. They are white; the face long and broad, with a tuft of wool on the forehead; tho shoulders low but broad; the chest deep; the loins broad; and the bone small; a hardy and useful sheep. Their chief peculiarity is the forwardness of the ewes, which supply the market with lamb, when it produces the highest price. If they have plenty of nutritious food, the ewes will be in lamb as early as April, so that the young one will drop in September, and be ready for the market at Christmas.

A very profitable variety is found in a cross between the South Down and the Dorset sheep. The carcase is increased, and the wool is rendered more valuable. The greater part of Dorsetshire is however occupied by the South Down sheep, and, on the whole, it is a far more profitable sheep than the pure Dorset.

Various breeds of short-wool sheep still prevail on the hills of Devonshire and Cornwall. They are evidently allied to or descended from the Dorset, although it must be confessed that the resemblance is not very flattering to the latter. The fleece is short, and mingled with too many kemps, but the mutton is supposed to possess a peculiarly delicate flavour, and great quantities of it are sent to the London market. They are much improved by a cross with tho Leicesters. The South Downs have rarely succeeded in either county, except in the most cultivated parts. In Cornwall especially the varied and humid climate has been very unfavourable to them.

Returning through Somersetshire, we again meet with the South Downs, either pure or materially improving the native breeds. The Wiltshires and the Dorsets have also established themselves with advantage in many parts of the county. These breeds have even penetrated to the hills of Mendip, and the wild sheep of the district have nearly or quite disappeared. In Gloucestershire, except on the hills on the northern and eastern parts of the county, the short-woolled sheep, even those belonging to the Ryeland breed, have given way to the Cotswolds or the Leicesters. In Monmouthshire, with the exception of tho small native breed on the hills, and a few flocks of South Downs which yet remain in different parts, the short-woolled breeds have materially diminished.

In Herefordshire we still meet with a few flocks of that breed of sheep, which was in forme: times the pride of the agriculturist—the Ryelands. They are small, polled, with white faces, the wool growing close to and almost covering the eyes, the carcase round and compact, the animal quickly fattening, and the superabundant fat accumulating within. They are hardy, and peculiarly free from disease. They are particularly distinguished by the fineness of their wool. The number and the nature of the serrations place it precisely where the manufacture had long done. It is decidedly superior in fineness and in fullness to the South Down, but yields in both of these qualities to the Merino wool. It was attempted to cross the Ryeland sheep with the Merino, in order to increase the value of the wool. To a certain extent this was accomplished, but it was at the expense of the carcase. The Merinos were then crossed by the Ryelands, with a view to the improvement of form, and greater tendency to fatten, but this also failed. While these experiments were proceeding, arrived the period when the fleece of the shurt-woolled sheep, both the South Down and the Ryeland, was materially changed by the altered system of sheep-husbandry that was introduced, and the wool of both was rejected by the manufacturer for the purposes to which it had hitherto been applied. The author of 'Sheep,' published by the Society for the Diffusion of Useful Knowledge, states, that in the year 1800 Herefordshire contained 500,000 short-woolled sheep, furnishing 4,200 packs of wool, the weight uf the fleece being two lbs. No long wool was then to be found in the county. In [illegible] the number of packs of short wool had diminished to [illegible], but no fewer than 5550 packs of long wool were grown, and the average weight of all the fleeces was four lbs. Such was the effect produced in the very territory and domicile of the finest-woolled sheep that England could produce. This fact speaks volumes as to the revolution that is going forward, and plainly points out the farmer's interest and duty.

Shropshire once contained several varieties of the short or middle-woolled breeds of sheep, and among them were the old Shropshires, the Mountain sheep, the diminutive Shoeberry, the Mynne or Mouna sheep, and more particularly the Morfe Common, whose fleece was once scarcely equalled even by the Ryeland. It was the country of the short-wools, but now they have rapidly diminished, or almost disappeared before the Cotswolds and the Leicesters.

It is the same with the Cannock-heath breed in Staffordshire. Even the Tedderly breed has shared the same fate. Some few short-woolled sheep remain on the commons, and some valuable flocks of the South Downs are sparingly scattered over the country.

The Delamere sheep is the only short-woolled breed deserving of notice in Cheshire. The wool is short and fine, and still used by somo manufacturers, but it is no longer used for any of the fine cloths.

The different districts of South Wales afford a small and valuable breed of sheep, principally used for the supply of the London market, where the Welsh mutton is in considerable request. These sheep seem scarcely to have changed their character fur many centuries, but some crosses of the South Downs have been lately introduced, and even some flocks of this sheep have begun, and with much prospect of advantage, to spread over the lower part of the country.

In North Wales, and particularly in Anglesea, the old South Down re-appears, or a sheep whose likeness to the unimproved South Down is too striking to escape observation. The purest and best blood that the mountains of Wales are now supposed to be capable of producing is found at the foot or on the declivities of Cader Idris. All the hills of North Wales are covered with sheep, which are sent in the spring from all parts of the low country. The strongest wethers remain on the mountains during the winter, and without the slighest artificial provision for their sup port. The others are brought down to the low ground about Michaelemas to be returned in the spring.

Lancashire contains few sheep. The principal middle-woolled breed is the Woodland horned sheep, spreading from the Yorkshire side of the county to the very extremity of Scotland, intermingling with, and improving or deteriorating every other breed, and themselves indebted for their best qualities to the South Downs or the Leicesters. The short-woolled sheep of Westmoreland scarcely deserve notice, except as connected with the Herdwicks and the Cheviots. The former are of Scottish origin. They were brought by a ship from the north which was stranded on the coast of Cumberland. They were said to be small, active, polled, with speckled legs and face, of a finer fleece than the common black sheep, hardy, and defying any degree of cold. This peculiar quality was early noticed, and gave them a value which was not overrated. By degrees they spread over the mountainous districts, and other breeds were crossed by them on account of this valuable property.

At three or four years old they weigh nine or ten lbs. per quarter, and the wool is finer than that of the common black sheep.

The Cheviots extend from Westmoreland far into Scotland. Their birth-place, or where they were originally observed, and are still found in their greatest purity, is the Cheviot Hills, in Northumberland. They differ essentially from both the black and the dun-faced breeds by which they are surrounded, but neither history nor tradition has given the slightest clue to their origin. The following is a description of the pure breed, thirty years ago, before they began to be crossed by the Leicesters:—'The head polled, bare and clean, with jaw-bone of a good length; ears not too short, and countenance of not too dark a colour; neck full, round, and not too long, well covered with wool, but without any coarse wool depending beneath; shoulders deep, full, and wide; chest full and open; chine long, but not too much so; straight, broad, and wide across the fillets; horns round and full; the body in general round and full, and not too deep or flat either in the ribs or flanks; the fleece fine, close, short, and thick set, of a medium length of pile, without hairs at the bottom, and not curled on the shoulders, and with very little coarse wool on the hips, tail, or belly.'

Sir John Sinclair adds the following account of them:—'Perhaps there is no part of the whole island where, at first sight, a fine-woolled breed of sheep is less to be expected than among the Cheviot Hills. Many parts of the sheep-walks consist of nothing but peat-bogs and deep morasses. During winter the hills are covered with snow during two, three, or even four months, and they have an ample proportion of bad weather during the other seasons of the year, and yet a sheep is to be found that will thrive even in the wildest part of it. Their shape is excellent, and their fore quarters in particular are distinguished by such justness of proportion, as to be equal in height to the hinder ones, which enables them to pass over bogs and snows through which a shorter legged animal could not penetrate. They have a closer fleece than the Tweeddale and Leicester breeds, which keeps them warmer in cold weather, and prevents either rain or snow from incommoding them. They are excellent snow-travellers, and are accustomed to procure their food by scraping the snow off the ground with their feet. They have never any other food but the grass and natural hay of their own fields, except when it is proposed to fatten them. They weigh from twelve to eighteen lbs. per quarter, and their meat is fully equal to any that the highlands can produce.'

The wool is inferior to that of the South Downs. It is not so fine as before the attempted improvement of the carcase, and the use of it is abandoned in the manufacture of fine cloth.

There are many flocks of pure Cheviots, but in the majority of the flocks there is a cross of Leicester blood.

The other breed of short-woolled sheep which contend with the Cheviots in number and value, is the *black-faced Scots*. They extend from Lancashire to the very north of Scotland. The males are mostly horned, the horns of a spiral form, but the females are frequently without horns. The faces and legs are always black or mottled: they are covered with wool about the forehead and lower jaw: the fleece is long and somewhat coarse. The carcase is peculiarly compact; so much so, that on account of the shortness, roundness, firmness, and handsomeness of the carcase, it is called the *short* sheep, in opposition to the Cheviots or *long* sheep. Great numbers of these sheep are sent to the London market. The weight of the carcase does not differ materially from that of the Cheviot, and the fleece weighs about three pounds after it is washed. These sheep have been improved by selection, but have derived little advantage from any of the crosses that have been tried.

As these are the prevailing breeds in the northern parts of the kingdom, if not to the exclusion of the short horns and the Leicesters, yet being far more numerous than they, it may not be interesting to institute a brief comparison of their respective merits. The three important points with respect to sheep in such localities are the weight and value of the wool, the carcase, and the degree of hardihood.

As to the wool there can be no question. The weight of the individual fleece may be somewhat, but not a great deal, in favour of the black-faced breed; but in point of value and the price which the wool will obtain, the advantage is most decidedly in favour of the Cheviots. As to the carcase, the Cheviot is ready for the market a full twelvemonth before the other. If so many sheep cannot be kept on the same quantity of ground, the quantity of meat that can be produced is greater, and consequently the profit of the farmer is greater; and as to hardihood, they are both of them excellent breeds, and it might be difficult to decide which wool would most successfully endure the hardships of a Highland winter. The adjudication on the whole is most decidedly in favour of the Cheviot breed, with this exception perhaps, that on the wildest of the Grampian or other similar hills the black-faced mountain sheep may have the best chance of doing well; and the acknowledged fact is, that in almost every northern district the Cheviots are rapidly superseding the native black-faced sheep.

One other breed of short-woolled sheep must be mentioned before we return to the southern part of the kingdom—those which inhabit the Shetland Islands. They frefrequently weigh not more than seven or eight pounds a quarter, and yield from one and a half to two pounds of fine and soft wool, either of a white, or grey, or even black colour. It is the finest wool which Great Britain can produce, and is used for the better sort of stockings, and for several light and extensive manufactures.

In Northumberland the *mugg* sheep, so called from their faces being completely covered with wool, have disappeared. In Durham there are few besides long-woolled sheep. The eastern and western moorlands of Yorkshire contain many short-woolled sheep—the Cheviots, the black-faced Scots, the South Downs, and some flocks peculiar to the moorlands, as the Penistone sheep with mottled or coloured faces and legs. In Lincolnshire some flocks of true South Down sheep are still to be found, in the northern and western districts, but the greater part of them have mingled with or given way to the long-woolled sheep. The beautiful little sheep on Shirwood Forest, not yielding more than eight or nine pounds to the quarter, and the delicate fleece which covered them, have passed away. In Derbyshire, Leicester, Rutland, Warwick, Northampton, Huntingdon, Cambridge, Bedford, Hertford, Buckingham, and Oxford, some flocks of the middle-woolled sheep are to be found, and many valuable crosses between the South Downs and the Norfolks, but on the whole the short-woolled sheep have declined.

Norfolk and Suffolk used to possess their peculiar breeds, with the face long and thin, flat on the forehead, and flattened at the muzzle, the legs long, the face and legs mottled, or liked the more if they are of a pure black, the fore-quarters deficient, the hind ones sufficiently developed; fattening readily at two years old; bearing without fatigue a journey to a distant fold, and therefore of great value to the farmer in rendering many a plot of land productive by occasionally affording almost the only manure that could be obtained. These, together with the disposition to feed even on the coarsest pastures, were qualities which rendered the Norfolks great favourites in their own country. Presently however came the comparison with the modern South Downs, who were remarkable for their quiet and contented disposition, compared with the wild and restless character of the Norfolks; the smaller quantity of food which they were thus enabled to consume in proportion to their size; the superior weight which they acquired in proportion to the food which they consumed; the greater quantity of wool which they yielded; the superior quality of that wool; the greater number of lambs that were produced; the tender and more attentive nursing of these lambs; all these circumstances united to prove the superiority of the South Downs. It was attempted to cross the rival breeds, and the experiment was attended by evident advantage to the Norfolks; but by degrees the pure breed was valued as it deserved to be, and the breed of the old Norfolks evidently and extensively diminished.

Most of the Norfolk flocks have now been crossed by the South Downs or the Leicesters. The animal has, in consequence of this, increased in size and in early perfection, and weight of fleece; and that fleece, more useful for many purposes, is almost doubled in value. Lord Western has obtained a cross of the South Down and Hampshire, omitting entirely the Norfolk, and with apparent advantage.

We now arrive at the *Long-Woolled Sheep*. Their early history is obscure; but in the twelfth century there are accounts of exportations of wool and of sheep, evidently belonging to the long-woolled variety, as appears from the manufactures in which these fleeces were employed. In the thirteenth century, certain Florentine merchants were permitted to export to Flanders more than a thousand sacks of combing or long wool. In the fourteenth century the thousand had extended to a hundred thousand, and that continued during many years; and in the fifteenth century Edward IV. permitted his sister Margaret to export annually during her life 2000 rams to Flanders and Holland. This well explains the resemblance between the sheep on the two shores; and the traveller will cease to wonder that on the northern coast of France, and through nearly the whole of Flanders, he fancies that he recognizes the identical sheep of the Kentish pastures. In the same century, a royal present of Cotswold wool was sent to the king of Portugal.

There is much more similarity between the varieties of the long-woolled sheep than those of shorter fibre. The deficiency of horns, the form of the head, the expression of the countenance, and the white faces and legs show that they had one common origin; while the colour and weight and uses of the wool speak their common origin.

The following description of the *new Leicester* by Mr. Culley will, to a very considerable degree, serve for all the varieties of the long-woolled sheep. The head should be hornless, long, small, tapering towards the muzzle, and projecting horizontally forwards. The eyes prominent, but with a quiet expression. The ears thin, rather long, and directed backwards; the neck full and broad at its base, but gradually tapering towards the head, and particularly fine at the junction of the head and neck. The neck seeming to project straight from the chest, so that there is, with the slightest possible deviation, one continued horizontal line from the rump to the poll. The breast broad and full; the shoulders also broad and round, and no uneven or angular formation where the shoulders join either the neck or the back, particularly no rising of the withers, or hollow behind the situation of those bones. The arm fleshy through its whole extent, and even down to the knee. The bones of the legs small, standing wide apart, no looseness of the skin about them, and comparatively bare of wool. The chest and barrel are at once deep and round in the ribs, forming a considerable arch from the spine, so as in some cases, and especially when the animal is in good condition, to make the apparent width of the chest even greater than the depth. The barrel ribbed well home. No irregularities of line on the back or the belly; but on the sides the carcase very gradually diminishing in width towards the rump. The quarters long and full, and as wide as the fore-legs. The muscles extending down to the back, the thighs also wide and full. The legs of a moderate length; the pelt also moderately thin, but soft and elastic, and covered with a good quantity of white wool, not so long as in some breeds, but considerably finer.

Such is the Leicester sheep as Bakewell made him. He found him as different an animal as it was possible to conceive—flat-sided, large-boned, coarse-woolled, slow to fatten, and his flesh of little value. Were there room for its insertion, a detailed history of the different steps of the changes would be most interesting to the reader. The means were simple, and the effect was almost magical. The principle was, that 'like produces like;' and therefore he selected a few sheep with aptitude to fatten, with a disposition to produce an unusual quantity of valuable meat, with little bone and offal, and with quietness of temper; and from these he exclusively bred. He cared not about near or distant affinities, but his object was to increase every good point, and gradually to get rid of every bad one. They were not different sorts of sheep that he selected, but the best of the breed to which he had been accustomed.

His sheep were smaller than those of his neighbours, but they retained every good point, and had got rid only of the bad ones. The alteration was rapid as well as great in his own flock, and the practice which he introduced of *letting* some of his rams quickly extended the benefit of his system far and wide. The first ram which he let was in the year 1760, at 17*s.* 6*d.* for the season. In 1789 he let one ram for 1000 guineas, and he cleared more than 6000 guineas in the same year by the letting of others. After that, so great was the mania, or rather the desire for improvement, that Mr. Lawrence calculates that 100,000*l.* were annually spent by the midland farmers in the hiring of rams.

Such was the origin and the eventual triumph of the new Leicester breed of sheep. They have spread themselves to every part of the United Kingdom. There are few other varieties of long-woolled sheep which do not owe much of their excellence to the new Leicesters, and even some of the short-woolled flocks are deeply indebted to the breed introduced by Bakewell. There is no other species of sheep that possesses so decided a propensity to fatten—or that is prepared for the butcher at so early an age. It will not however thrive on a poor soil, nor if it is compelled to travel far in order to procure its food; but on soils of a moderate quality there is no other sheep so profitable. Other breeds, as the Teeswater and the Lincoln, may be superior in size, but it is at an expense of time and of food, and eventually a palpable deterioration of flesh and diminution of profit. The new Leicesters on fair keep will yield a greater quantity of meat, for the same quantity of food, than any other breed of sheep. The meat is of a peculiar character. It is disliked by some on account of a supposed insipidness. The fatty matter is too much introduced between the muscular fibres, and there may be the appearance and the taste of a mass of luscious fat. This however is the fault of the breeder, and not of the animal; it marks the point to which the fattening process should be carried, and where it should stop. It is the fault of the grazier if he converts that which is an excellence into a fault.

There are accounts of the Leicester sheep attaining a very great weight. Two prime wethers exhibited by Mr. Painter at the Smithfield cattle-show in 1835 weighed 165 and 153 lbs. It should however be remarked that the new Leicester sheep has a smaller quantity of bone in proportion to its weight than any other sheep.

The deficiency of the fleece was formerly objected to in the new Leicester sheep. The truth of the matter was that, with the early breeders, the fleece was a perfectly secondary consideration, and comparatively disregarded. There is now little cause for complaint on this head. The wool has considerably increased in length, and it has improved both in fineness and strength of fibre. It averages from 6 to 7 lbs. the fleece, and the fibre varies from five to more than twelve inches in length. Like all other British wools it is applied to a purpose different from that to which it was formerly devoted, and is mostly used in the manufacture of serges and carpets.

The chief value of the new Leicester breed consists in the improvement which it has effected in almost every variety of sheep with which it has been crossed. Most of the breeders of the South Downs were at first averse to admit a cross with the Leicesters; but when the wool of the South Downs began to be applied to purposes very different from those to which it had been formerly devoted, a cross with the Leicesters was reluctantly attempted. A sheep was produced, probably not so hardy, but coming earlier to the market, yielding a longer and a finer fleece, of nearly double the weight and with a combing wool adapted for many valuable purposes.

Many of the Dartmoor and Exmoor sheep have obtained earlier maturity, an increased size, and a more valuable fleece by a cross with the Leicesters. In Somersetshire the Bampton sheep have decidedly increased in value by a cross with the Leicesters. The Ryelands, now that their wool is no longer employed in the manufacture of fine cloth, have materially profited by crosses with the Leicesters: the profit from the carcase is increased, and the wool has a readier sale. In Worcestershire and Staffordshire the advantage of a cross with the Leicesters is acknowledged by every one who has ventured to make the experiment. In South and in North Wales they have found powerful antagonists in the Cotswolds; but in Lancashire, in Westmoreland, and in Cumberland, the native short-woolled sheep have been crossed by the Leicesters with considerable benefit.

In Northumberland the black-faced sheep are numerous, and it is the native country of the Cheviots; but the valleys and plains, and these are numerous and fertile, will bear the larger Leicester breed. Some attempts have been made in Northumberland to cross the Leicester breed with the large and coarse rams of Teeswater or old Lincolnshire breeds, but the experiment has almost uniformly failed, for the produce has had inferior wool and inferior flesh, and has been defective in form and slower in growth, with a much lighter carcase.

It is however difficult to select any part of the kingdom into which the Leicester and the South Down sheep have not penetrated, and where they have not materially improved the native breed. The weight both of the sheep and of the fleece have been increased, and the farmer actually derives a better remuneration from his flock than when the wool was short and fine and of little weight, although it obtained a better price.

A short account must be given of the other breeds of long-woolled sheep, although some of them are rapidly passing away. The Teeswater, inhabiting the southern districts of Durham and the north of Yorkshire, was once in considerable request on account of the weight of its carcase, the goodness of its flesh, and the remarkable degree in which the ewes were prolific. Its greatest fault was that it was too heavy for the lowlands in which it was placed, and the pasture was trodden down and destroyed. Some of the Leicesters found their way to the banks of the Tees, and the old breed was crossed by them. The carcase became somewhat smaller, but it was more compact and profitable. More mutton was produced on the same quantity of land, and, after a considerable time, for the improvement was always slower with regard to the wool than the flesh, the fleece became finer and closer. The old breed of this and the neighbouring counties gradually diminished and almost disappeared.

The largest and most ungainly breed of sheep was the Lincolns, 'hornless, with long, thin, and weak carcases, large bones, weighing from 20 to 30 lbs. a quarter; the wool averaging from 8 to 14 lbs. the fleece; the sheep a slow feeder, and the flesh coarse-grained.' This is the account given of them by a good, but a prejudiced observer, Mr. Culley. In fact, while Bakewell and his admirers were almost neglecting the fleece, the Lincolnshire farmer was quite as inattentive with regard to the carcase. Both parties were wrong. The old Lincolnshire sheep yielded a wool which in quantity and in quality was unrivalled, while the Leicesters could boast of a disposition to fatten which the other could never equal. At length the attempt was honestly made to amalgamate the valuable qualities of the two breeds. In consequence of the cross, the wether attained its maturity a full year sooner than it was accustomed to do, and the fleece became finer and improved in colour, but it was shorter and more brittle, and not fitted for some of its former purposes. On the whole, a great improvement has been effected both in the carcase and the fleece, and so satisfactory did this prove, that it is now difficult to find any sheep in Lincolnshire that have not been crossed with the Leicesters. This cross is deeper on the wolds than in the marsh lands, which may serve to account for the difference of the fleece in the two. The breed of these sheep generally has been greatly increased since the introduction of the turnip system.

Among the long-woolled sheep that have been improved by the admixture of the old and new long-woolled breeds and the altered system of husbandry, the inhabitants of Romney Marsh must not be forgotten. From time immemorial a peculiar and highly valuable breed was cultivated there. The produce in wool and the thickness in stocking were scarcely equalled in any other breed or situation. The Kentish men obstinately resisted every encroachment on their favourite breed, and predicted disappointment and loss in every possible form. 'For a while,' says the author of the work on Sheep already referred to, 'it seemed as if they had reason on their side, for the size of the sheep was considerably lessened, and the wool was not so valuable, nor yielded in its former quantity. By degrees however it began to be found that these smaller, deeper, closer and more compact sheep weighed heavier than the old long-legged and long-bodied ones; that they did not consume so much food, that the hard stocking of former days might be increased, that they were ready a full year sooner for the market, and therefore became far more profitable. That the fat formed more on the exterior of the animal, where it was advantageously placed for the farmer and the consumer, and did not accumulate within for the profit of the butcher alone; and that, by careful selection, although the wool was somewhat shorter and lighter, it was improved in firmness and colour and felting property.'

Some valuable breeds of long-woolled sheep are found in the South Hams in Devonshire, extending from Axminster to Dartmoor, and from the north of Devon to the vale of Taunton, under the name of the Bampton sheep, and also, but smaller in number and size, in the neighbourhood of Exmoor.

The Cotswold sheep, so called from the cots or sheds in which they were housed, formerly inhabited the counties of Gloucester, Hereford, and Worcester. They were a long-woolled breed, yielding in the fifteenth century a description of wool much valued on account of the fabrics in the construction of which it was employed. Both the sheep and the wool were largely exported. Even they, like the rest, have amalgamated themselves with and been in a manner lost among the Leicesters. They were taller than the present sheep, flat-sided, deficient in the fore-quarter, but full in the hind-quarter, not fattening so early, but yielding a long and heavy fleece. Many of these good qualities have been preserved, and to them have been added that which is of so much importance to the farmer, the capability of rearing and fattening so many more sheep on the same quantity of land, and of bringing them so much earlier to the market.

The *Irish* sheep, like those in Great Britain, are divided into the short and long-woolled breeds. The *short-woolled* are most numerous in the mountains of Wicklow. The head is small and bare; the general proportions good if there were somewhat more substance; the legs small and clean; the fleece coarse and wavy, or occasionally matted, and yielding a fleece of from 2 to 3 lbs., which is appropriated chiefly to the manufacture of flannel. Many of the flocks have with much advantage been crossed with the South Downs, in defiance of the prejudice and jealousy of a proportion of the Irish farmers. The progenitors of the *Irish long-woolled sheep* seem to have been as ill-bred and as unprofitable as the worst of the class in England; but the Leicester breed has found its way to Ireland; it struggled for a while against prejudices and difficulties of every description, and at length has completely triumphed. The Irish sheep which are now brought so plentifully to the English market will scarcely yield to the best improved Leicesters that any part of Great Britain can produce.

The English wool being, from the increased coarseness of the fibre, rejected by the manufacturer in the construction of fine cloths, recourse was had to foreign wools, and to those chiefly that were derived from the Merino sheep. As early as the commencement of the Christian æra, the wool of the Spanish sheep was in great request for the production of the most costly dresses. In less than half a century afterwards we find Columella busily employed in improving the Spanish sheep, and the effect of his labours remained during the long dark ages that succeeded. [COLUMELLA.] The Merino flocks withstood the baneful influence of almost total neglect, and continued, to a greater or less degree, to furnish the finest and the choicest wool.

By degrees the Merino sheep found its way to almost every part of the European continent, and by careful management its fleece rapidly increased in fineness and in usefulness. In 1834 the prime wool produced in Spain readily found a sale at from 3*s.* 6*d.* to 4*s.* per lb. In Saxony it reached to 5*s.* 3*d.* per lb., and in some parts of Hungary to 5*s.* 6*d.* In Australia the cultivation of the Merino sheep and its fleece has proceeded most rapidly and prosperously. The best of its wool when it reached England was sold at 4*s.* 6*d.* per lb. That from Van Diemen's Land was not half so highly estimated, but it has since improved. The wool of our primest South Down hoggets would at that time rarely produce more than 2*s.* 2*d.*, and yet the farmer was better off, for he obtained an earlier and a better and a larger carcase, and a greater quantity of wool.

Our notice of the sheep in other countries must be exceedingly brief. Along the western coast of France the traveller continually meets with the semblance of those noble animals which Edward IV. permitted to be annually sent to improve the breed of foreign sheep on the other side of the Channel. The wool is now about the same in value as that of our inferior Lincoln or Kentish. In Normandy is a larger and a coarser variety of the same breed. In the old province of Maine succeeds the old unimproved, long, and thin-carcased native French breed. In Bretagne and Gascony will be recognised the native short-wools, some of them exceedingly valuable; in Navarre, a mountain breed, with its *kempy* fleece; in the Lower and the Higher Pyrenees, the two essentially different breeds which countries so different yet so near to each other produce. On entering Rousillon some migratory breeds scarcely inferior to the Merinos are found, and also in Languedoc and Arles. The whole number of sheep in France is calculated at about 30,000,000.

Notwithstanding the accounts given by some authors of the *Italian* sheep and of the care bestowed on them, there are few deserving of notice except a few Merinos. With the exception of a few of the valleys, the same may be said of the *Swiss*, and also of the *Savoy* sheep, but in *Piedmont* there has been from time immemorial a breed of sheep inferior only to the Merinos. In most of the *German States* the Merino is almost the only sheep that is cultivated. It is the same in *Prussia*, except that the sheep are somewhat diminished in size, while the wool retains all its value. The chief wealth of *Hungary* is derived from the cultivation of the Merino sheep. Of the two *Hanoverian* breeds the larger one has almost disappeared; the smaller has been crossed with the Merinos, and yields a wool of some value for ordinary purposes. The *Dutch* and *Flemish* breeds are of English origin, although some of them have considerable resemblance to the Irish long-woolled breed. Their wool is used for the production of the coarser kinds of goods.

This will be the proper place to speak of the *shearing* of the sheep, or the separation of the fleece from the animal. The time for this operation will vary much with the state of the animal, and of the season. After a cold winter, and the animal having been neglected, the sheep will be ready at an early period, for the old coat will be loosened and easily removed. The operation should never be commenced until the old wool has separated from the skin, and a new coat of wool is sprouting up. The coldness or warmth of the spring will also make a great difference. The usual time for shearing is about the middle of June, and the sheep master will in a moment perceive when the fitting time is come. It is a bad practice to delay the shearing, for the old fleece will probably have separated, and the fly will have longer time to do mischief, and the growth of the new fleece will have been stinted, or a portion of it will be cut away by the sheers.

Custom has very properly required that the old fleece shall be cleansed before its removal, by washing the animal in some running stream. Two or three days are then allowed for the drying of the wool previous to its being shorn, the sheep being turned into a clean rick-yard, or field or dry pasture, and remaining there until the fleece is dried, and that the new yolk, which is rapidly secreted, may penetrate through it, giving it a little additional weight and a peculiar softness. As soon as the sheep is shorn, the mark of the owner is placed upon it, consisting of lamp-black and tallow, with a small portion of tar, melted together. This will not be washed away by any rain, but may be removed by the application of soap and water.

On the score of humanity, one custom must be decidedly protested against—the shearing of a flock of sheep before they are driven to the market in an early part of the spring. The farmer thinks that he shall get nearly or quite the same price for the sheep whether the wool is off or on. But does he find this to be the case? When the poor animals are shivering under the influence of the cold air, do they look so attractive? Do they handle well? Is there not an appearance of disease about them? Does not the rheum that hangs about the nostrils indicate the actual commencement of disease?

Few rules can be laid down with regard to the rearing and feeding of sheep that will admit of anything like general application. A great deal depends on the kind of sheep, and the nature of the pasture and the food.

Suppose the larger kind of sheep, and on arable ground. The ewes are generally ready to receive the ram at the beginning of October, and the duration of pregnancy is from about twenty-one to twenty-three weeks, bringing the period of parturition to nearly the beginning of March, at which time most of the lambs will be dropped. The ewes should be fed rather better than usual a short time previous to the male being introduced. Rams are fit to propagate their species in the autumn of the second year, and that is also the proper period for the impregnation of the ewes. The ewe is, after impregnation, suffered to graze on the usual pasture, being supplied, as occasion may require, with extra food, and especially in case of snow, until within five or six weeks of lambing, when turnips are given to her, and continued from that time until the spring of grass renders them no longer necessary. The turnips are laid out for the ewes in the grass fields in certain quantities each day, but by no means so many as they would consume if permitted to feed without restriction, as it is considered to be most important that they should not be too fat when the lambing season approaches. The hogs and the fattening sheep of the previous year, now one year and a half old, are put upon the turnips in October, or whenever the pastures cease to improve their condition. The turnips required for the cattle, or the ewe-flock, are then drawn off in alternate rows, in the proportion of one-half, one-third, or one-fourth, as the convenience of the situation, the goodness of the crop, or the quality of the land may dictate. The remainder are consumed on the ground by the other sheep.

As the period of parturition approaches, the attention of the shepherd should increase. There should be no *dogging* then, but the ewes should be driven to some sheltered inclosure, and there left as much as possible undisturbed. Should abortion take place with regard to any of them, although it does not spread through the flock as in cattle, yet the ewe should be immediately removed to another inclosure, and small doses of Epsom salts with gentian and ginger administered to her, no great quantity of nutritive food being allowed.

The ewes should now be moved as near home as convenience will permit, in order that they may be under the immediate observation of the lamber. The operation of *clatting*, or the removal of the hair from under the tail and around the udder, should be effected on every long-woolled ewe, otherwise the lamb may be prevented from sucking by means of the dirt which often accumulates there, and the lamber may not be able at all times to ascertain what ewes have actually lambed. The clatting before the approach of winter is both a useless, cruel, and dangerous operation.

The period of lambing having actually commenced, the shepherd must be on the alert, yet not unnecessarily worrying or disturbing the ewes. The process of nature should be permitted quietly to take its course, unless the sufferings of the mother are unusually great, or the progress of the labour has been arrested during several hours, or eighteen or twenty hours or more have passed since the labour commenced. His own experience, or the tuition of his elders will teach him the course which he must pursue. In the work on 'Sheep' these things are fully explained.

If any of the newly dropped lambs are weak, or scarcely able to stand, he must give them a little of the milk, which at these times he should always carry about him, or he must place them in some sheltered warm place; in the course of a little while, the young one will probably be able to suck its dam. The lambing field often presents at this period a strange spectacle. 'Some of the younger ewes, in the fear and confusion and fright of their first parturition, abandon their lambs. Many of them, when the udder begins to fill will search out their offspring with unerring precision; others will search in vain for it in every part of the field with incessant and piteous bleating; others again will hang over their dead offspring, from which nothing can separate them; while a few, strangely forgetting that they are mothers, will graze unconcernedly with the rest of the flock.'

The shepherd will often have not a little to do in order to reconcile some of the mothers to their twin offspring. The ewe will occasionally refuse to acknowledge one of the lambs. The shepherd will have to reconcile the little one to its unnatural parent, or to find a better mother for it. If the mothers obstinately refuse to do their duty, they must be folded by themselves until they are better disposed; and on the other hand, if the little one is weak and perverse, he must be repeatedly forced to swallow a portion of her milk until he acknowledges the food which nature designed for him.

The operation of castration should be performed nine or ten days after the birth of the lamb; that of spaying, if it is intended to be practised, should be postponed until the animal is about six weeks old.

Unless the pasture on which the ewes are placed is very good, it will be advisable to continue the use of the turnips. A moderate quantity may be given twice in the day, care being taken that the whole of one quantity shall be eaten before any more is placed before them. This is a better practice than hurdling off certain portions of the field for the sheep, unless the land is perfectly dry.

A little hay will always be serviceable while the flock is fed on turnips. It corrects the occasional watery quality of the turnips, and the sheep usually thrive better than if they are fed either on hay or turnips alone. Bran and oats, with oil-cake, have been recommended for the ewes before weaning time, but this is an expensive measure, and its cost can hardly be repaid either by the ewe or the lamb.

By the end of March or the beginning of April the turnips are generally nearly consumed, and the farmer is occasionally a little puzzled to find sufficient food for his flock. He should have had some plots of rye to support them for awhile. Rye-grass and clover are very serviceable. Swedish turnips that have been carefully stacked on dry straw will be most useful, for the Swedes, properly prepared and stacked, will retain their nutritive quality until the flock can be conveniently supplied with other food. Ruta-baga and burnet are always useful for spring food. The good qualities of the latter are not sufficiently estimated. It will generally be ready by the middle of February if required. The rowen, or after-grass, likewise furnishes plentiful and wholesome food for the lambs.

At length comes the time for weaning. In a poor country it takes place before the lambs are much more than three months old. In a more plentiful one the lambs may be left until the fourth month is nearly or quite expired. If the pasture is good, and it is intended to sell the lambs in store condition, the weaning may be delayed until six months. Whichever time is selected, it is of essential consequence that the mothers and the dams should be placed so far apart that they cannot hear the bleatings of each other. The ewes should be somewhat carefully looked after, and if any of them refuse to eat, they should be caught, the state of the udder ascertained, and proper measures adopted.

The lambs should not be put on too stimulating food. The pasture should be fresh and sweet, but not luxuriant. It should be sufficient to maintain and somewhat increase their condition, but not to produce any dangerous determination of blood to any part.

The Diseases of Sheep.—The rapid progress which the veterinary art has lately made, has thrown great light on the maladies to which the sheep is liable, and the mode of preventing or removing them.

Commencing with the muzzle and head, there is a disease, or rather, annoyance to which sheep are exposed by the persecution of a fly, the *Œstrus Ovis*, or *Gadfly* of the sheep. At some uncertain period between May and July, this fly is perseveringly endeavouring to lay its eggs on the inner margin of the nostril of the sheep, whence, hatched by the warmth and moisture of the situation, and assuming its larva form, it crawls into the nostril in order to reach the frontal sinus. Instinctively alarmed by the buzzing of the fly, or the motions of the larvæ, the sheep congregate with their heads in the centre, pawing continually with their feet, and expressing their dislike and fear in every possible way. It remains in the sinus a certain period, until it has attained its full growth, when it endeavours to escape in order to undergo another transformation. It escapes from the nostril, burrows in the earth for awhile, assumes its pupa state, undergoes its final change, and assumes the form of a fly, and then becoming impregnated, seeks again the nostril of the sheep. All that can be done with regard to this nuisance is to destroy the flies, which are generally to be seen on the walls or pales in the neighbourhood of the flock, and which the shepherd, or shepherd's boy, should be taught to recognise. [Œstridæ.]

Another parasite is a species of hydatid, the *Cœnurus* or *Hydatis Polycephalus Cerebralis*. It has the appearance of a bladder sometimes filled with pellucid water, or, occasionally, with myriads of minute worms, or smaller hydatids. Its residence is the brain, either beneath the inner membrane of the brain, or in the scissure between its two hemispheres. The origin of it is not clear, except that it is connected with bad management, being scarcely known in upland pastures or in grounds that have been well drained. As the parasite grows, it presses upon the neighbouring substance of the brain, and interferes with the discharge of its functions. There is an aberration of intellect; the sheep is frightened at any trifling or imaginary object; he separates himself from his companions; he commences a strange rotatory motion even while he grazes, with the head always turned towards the same side. This is the characteristic symptom, and as soon as it is perceived the animal should be destroyed, for there is no certain cure, and many of the operations that some persons have described are cruel and inefficient. The duty of the farmer is to destroy the *sturdied sheep* as soon as the disease is ascertained, however poor it may be in condition.

A somewhat similar disease, but with which the hydatid has nothing to do, is *Hydrocephalus*, or *water in the head*, generally indicated by a little enlargement of the skull; a disinclination to move; a slight staggering in the walk; a stupidity of look, and a rapid loss of condition. This disease seldom admits of cure or palliation. If any amendment can be effected, it will be by the administration of good food, tonic medicine, and gentle aperients. When water in the head is an occasional visitant in a stock of sheep, there is something wrong in the land, or its management, or in the nature of the food, or the character of the sheep.

Another species of pressure on the brain is of too frequent occurrence—*Apoplexy*. A flock of sheep shall be in apparently as good and fine condition as the farmer can desire. They have for a considerable period grazed on the most luxuriant pasture, and are apparently in the highest state of health. By and bye, one or more of them is, without any previously observed change, suddenly taken ill. He staggers, is unconscious, falls and dies, and perhaps within a quarter of an hour from the first attack. With regard to how many overfattened sheep is this the case? The owners taking them to some cattle-show, say that they died of inflammation. Inflammation had nothing to do with it. The sheep had been brought to the highest and most dangerous state of condition. Every vessel was overloaded with blood, and then some trifling exertion being required, or the animal being a little disturbed, the nervous functions were suspended, and the vital current suddenly arrested. Very few persons have gone into a cattle-show without being painfully struck with the evident distress exhibited by some of the overgorged animals.

If there is time for resorting to curative means, the jugular vein should be opened, and aperient medicine administered.

Inflammation of the brain is a frequent consequence of this strange over-feeding. It is ushered in by dullness and disinclination to move; but presently the eye brightens, and the animal attacks everything within his reach. If it can be managed, the same treatment must be adopted—bleeding, physic, and low feeding.

Locked-Jaw is not an unfrequent disease among sheep. It commences with an involuntary spasmodic motion of the head, accompanied by grinding of the teeth, but the latter symptom is presently succeeded by fixedness of the jaws. The disease often runs its course in a little more than twelve hours. The principal cause is cold and wet. After an unusually cold night, it is not uncommon to find many ewes that have lately lambed, and many lambs recently dropped, dead and stiffened. It sometimes occurs after castration, and at weaning time. Bleeding, aperient medicine, an opiate given an hour after the physic, and also a warm bath, are among the most likely means of cure.

Epilepsy is a not unfrequent disease among young sheep which are exposed too much to cold or dismissed from the fold too soon in the morning. Care and nursing will sometimes recover them, or a little exercise forced upon the patient.

Palsy.—The appearance of this disease is mostly confined to the ewe and lamb at weaning time, or when they are left at night in a bleak and exposed situation. The vital heat is abstracted by the cold bed on which they lie, and the cold air around them, and there follows a compound of rheumatism and palsy, the latter predominant and most obstinate. In the majority of cases they will never regain their former condition or value, but continue a disgraceful exhibition of the carelessness and inhumanity of the owner. It is dreadful to think how many animals in some districts are thus destroyed. No little art and kind treatment are in some cases requisite in order to recover these neglected and abused creatures. Warm gruel or milk, and a moderate degree of warmth, are the chief restoratives that can at first with safety be applied. A little ginger and spirit of nitrous ether may be added to the gruel when the patient begins to recover.

Rabies.—The rabid dog seems to have an irresistible propensity to worry sheep, and the poison is as fatal in this as in any other animal. There are cases on record in which from twenty to thirty have been bitten by the same dog, and all have died. If it can be proved that the flock has been attacked by a mad dog, every sheep should be most carefully examined, and if the slightest wound is found upon him, he should be destroyed. The carcase is not injured for the butcher, nor is there at that time any danger in eating the flesh; but, when the disease has broken out in the flock, no sheep that has exhibited the slightest trace of it should be used for human food.

There is no cure for rabies, and he will incur fruitless expense who has recourse to any pretended nostrum for this purpose.

Ophthalmia is a very frequent disease among sheep. The old people used to say that the animal had disturbed a lark's nest, and that the lark had spurred him blind. If any inflammation of the eye is detected, that organ should be frequently bathed with a weak solution of Gowland's lotion to which a few drops of laudanum have been added. It is sometimes difficult to get rid of this affection, and cataract and permanent blindness will ensue. The Ettrick shepherd says that 'a friend will generally attach itself to the sufferer, waiting on it with the most tender assiduity, and by its bleating calling it from danger and from going astray.'

Hoove is a morbid distension of the paunch with food, and the extrication of gas from that food. An account has been given of this disorder in the article Ox, vol. xvii., p. 81, so that every purpose will be answered by referring to it. The same may be said of all the diseases of the digestive organs. Their structure is the same in cattle and in sheep; and the causes and appearances and treatment of disease are the same.

There is however a disease of the liver—*the Rot*—far more frequently occurring in sheep than in cattle, and bearing a peculiar and more destructive character.

In the very earliest stage alone does it admit of cure. The decisive symptom, at that time, is a yellow colour of the eye that surrounds the pupil and the small veins of it, and particularly the corner of the eye, which is filled with a yellow serous fluid, and not with blood. There is no other apparent morbid appearance until it is too late to struggle with the malady; on the contrary, the sheep, although perhaps a little duller than usual, has an evident propensity to fatten.

The rot is a disease of the liver—inflammation of that organ; and the vessels of it contain fasciolæ (*flukes*). The flukes are probably more the effect than the cause of the disease. They are taken up in the food; they find their way to the liver as their destined residence, and they aggravate the disease by perpetuating a state of irritability and disorganization. The rot is evidently connected with the state of the pasture. It is confined either to wet seasons or to the feeding on ground that is moist and marshy. In the same farm there are fields on which no sheep can be turned without getting the rot, and there are others that never give the rot. After long continued rains it is almost sure to appear. The disease may be communicated with extraordinary rapidity. A flock of sheep was halted by the side of a pond for the purpose of drinking; the time which they remained there was not more than a quarter of an hour, yet two hundred of them eventually died rotten. In the treatment of the rot little that is satisfactory can be done. Some sheep have recovered, but the decided majority perish in despite of every effort. The patients however may, as giving them a little chance, be moved to the driest and soundest pastures; they may undergo a regular course of aperient medicine. Mercurial friction may also be used, but, above all, plenty of salt should be placed within the animals' reach, and given to them in the way of medicine.

In the way of prevention the farmer may do much: he may drain the most suspicious parts of his farm. No money would be more profitably expended than in accomplishing this. Some of the little swampy spots which disgrace the appearance of his farm possibly lie at the root of the evil

Redwater, or the effusion of a bloody serous fluid in the cavity of the abdomen, is a frequent and very fatal disease among sheep. The cause of it is a sudden change from one pasture to another of almost opposite quality, or the moving of the flock from a dry and warm to a damp and cold situation. It is most destructive to lambs if exposed to a hard frost or suffered to lie on a damp and cold soil. The sheep will separate himself from the rest of the flock; he will evince a great deal of pain, by rolling about, and frequently lying down, and immediately getting up again; and, sometimes, he dies in less than twenty-four hours from the first attack. The belly will be found swelled and filled with the red water, or serous fluid tinged with blood, from which the disease derives its name. The treatment should consist of mild aperients, with gentian and ginger, and a liberal allowance of hay and corn. Inflammation of the coats of the intestines (*Enteritis*) would not always be readily distinguished from the last disease, except that there is more stamping on the ground and striking the belly with the hind legs, and occasional lying on the back. The principal causes of enteritis are improper food, or an excess of that which is healthful, or exposure to cold and wet. Here also bleeding is imperatively required, but the purgative should not consist of anything stronger than sulphur. *Diarrhœa* is a very prevalent disease among lambs, and especially after a change of diet or of situation. When it is not violent, and does not seem to be attended by colic, a little absorbent and astringent medicine, with a few grains of opium, may be administered. The diarrhœa of sheep may be similarly treated, but when the disease is assuming the character of *dysentery*—when the discharge is more frequent and copious, and mingled with mucus, a larger quantity of this medicine should be given, and some blood abstracted if there is any degree of fever.

The diseases of the *respiratory organs* are often of a serious character. During the greater part of the winter the nostrils will sometimes be filled with mucus, and the sheep is compelled to stop for a moment at every second or third bite, and snort violently, and stand with his muzzle extended and labouring for breath. If his general health does not seem to be affected, this *nasal gleet* will all pass away as the spring approaches. If however any of the flock should now appear to be losing flesh and strength, it is too probable that *consumption* is at hand. The only chance of saving or doing them any good will be to place them in some comfortable pasture, letting them have salt within their reach, and giving them the hydriodate of potash, in doses gradually increasing from three grains to twelve, morning and night.

Lambs, when too early and too much exposed, are subject to diseases of the upper air passages (*laryngitis* and *bronchitis*), the one attended by a ringing cough, and the other by one of a more wheezing sound. Bleeding will always be necessary for the first, with aperient medicine. A mild purgative will usually suffice for the second, or possibly an ounce or an ounce and a half of common salt may be given dissolved in six ounces of lime-water.

Inflammation of the lungs, recognised by difficulty of breathing, heaving at the flanks, and distressing cough, is a disease of frequent occurrence in sheep. It speedily runs its course, and the lungs are found to be one disorganised mass. Bleeding and purging are indispensable; but as soon as the violent symptoms seem to remit, tonics, composed of gentian and spirit of nitrous æther, must follow.

Epidemics.—Sheep are not so liable to the attack of these diseases as horses and cattle. At the time however at which these records are attempted, the sheep are suffering from a somewhat serious epidemic. They have cough and discharge from the nose and eyes. The appetite has ceased. Those that are affected by the disease separate themselves from the rest of the flock; they are continually lying down, and many of them die. They exhibit after death inflammation through all the contents of the chest and abdomen, with effusion into the cavities of both. The disease is most rapid in its course. The shepherd may leave his flock in the morning free apparently from any immediate danger, and when he returns in the afternoon he will find two or three of them dead. Epsom salts with nitre may be given. Blood was abstracted if the case seemed to require it; and the medicine repeated sufficiently often to keep the bowels gently open. If the purging becomes considerable, a little starch with chalk and cinnamon may be serviceable. Those that will eat should be foddered with good hay, and the others forced with gruel, being kept dry and comfortable with plenty of clean straw under them. The detached horn should be pared from the feet where there was any separation, and the parts washed with a solution of blue vitriol, and then smeared over with melted tar. The mouth and tongue, on which there generally are some ulcers, should be dressed with a strong solution of alum in water. Under this treatment most of the patients rapidly recovered.

Garget.—Inflammation of the udder is more frequent in the ewe than in the cow. The udder should be well fomented with warm water, and then, if there are no large knots or kernels, she should be returned to her lamb, whose knocking about of the udder will generally be productive of good rather than harm. If, however, she refuses the lamb, a drachm of camphor and mercurial ointment may be well incorporated with an ounce of elder ointment, and a little of it well rubbed into the udder every morning and night. If the udder should still continue to enlarge, a free incision must be made into that part where the swellings are largest. A weak solution of chloride of lime should then be applied, and when the putrid smell is gone, the Friar's balsam should be used. In a few days the wound will generally be healed, and the lamb may be returned to its mother.

Diseases of the Feet.—There is a small opening at the bifurcation of the pasterns, which leads to a canal running down the inner face of each to the commencement of the hoof. The function of this canal is a matter of doubt; but dirt or gravel or other foreign bodies sometimes get into these canals, and produce considerable pain, inflammation, and ulceration. The treatment consists in the extraction of any of those extraneous substances that can be got at, and the fomenting and poulticing, or scarifying the parts, or effecting incisions into the canal, and applying a caustic or a balsam, as the case may require.

The treatment of *foot-rot* essentially consists in paring away all loose and detached horn. This is the corner-stone of skilful and successful practice. All fungous granulations must either be cut away, or destroyed by the muriate of antimony, and the foot well washed with a solution of chloride of lime. The muriate of antimony must then be lightly applied over the whole of the denuded surface. This must be repeated daily until the whole of the foot is covered with new horn. The diseased sheep must not be permitted to join his companions until the cure is complete, for it is a sadly infectious disease, and may easily spread through the whole flock.

The Scab is a very troublesome disease, common in the spring and summer. The sheep is continually scratching himself with his feet, tearing off the wool, and violently rubbing himself against every protruding substance. The disease first appears in the form of minute pustules, but several of these unite and form a scab. The health of the sheep becomes rapidly affected under this disease, and some of them pine away and die. It is a very infectious disease, for every place against which the sheep can rub himself becomes tainted with the poison. The sheep must be housed and shorn as closely as possible, and then well washed with warm water. An ointment composed of one part of mercurial ointment and seven of lard must then be procured, and such a quantity of it as the diseased parts seem to require rubbed in on every second day. Every place in the field and in the fold against which he can possibly have rubbed himself must be well cleaned and painted before he is permitted to return. The cause of scab consists in the presence of a minute insect or tick, which may be conveyed from one sheep to another when an infected sheep comes in contact with a sound one; or it may be left on the rubbing-post, and entangled in the wool of the next animal that comes in contact with it; or it may be the product, and is too often so, of disease of the part. It is of spontaneous origin, as well as the product of contagion, and is called into existence by the derangements which our neglect, or accident, or disease has made in the skin. This is a view of the case that should never be forgotten by the sheep-owner.

Lice and *Ticks* will be best got rid of by the application of the mercurial ointment just recommended.

The Fly.—Several species of fly frequently deposit their ova on the wool of the sheep. If there are any sore places, they are selected for the habitation of the larvæ. The head, as the most exposed part, is the one oftenest attacked, and the sheep are sadly tormented by the fly and the larvæ. The best preservative or cure is the application of a plaster composed of a pound of pitch and a quarter of an ounce of bees' wax, spread on soft leather or linen. The attack may however be generally prevented by the application of a small quantity of spirit of tar to the head, or any bare or sore part. Two or three applications of this will be sufficient for the whole of the summer, and not a fly will approach a sheep thus guarded.

SHEERNESS, a town in the isle of Sheppey, in Milton hundred, in the lathe of Scray, in the county of Kent. It is 48½ miles from London, by Dartford, Gravesend, Rochester, and by the King's ferry over the West Swale; in 51° 27′ N. lat., 0° 45′ E. long. It stands at the north-west point of the Isle of Sheppey, on the east side of the Medway, at the junction of that river with the Thames. In the time of Charles I. the site of the town was a swamp, at the extremity of which, after the Restoration, a fort was built, and mounted with twelve guns to secure the passage up the Medway. When the Dutch war broke out, it was intended to augment the fortifications; but on the 10th July, 1667, the Dutch forced their way up the Medway, beat down the defences, and took the fort, which was incomplete. It was however soon restored on an enlarged scale, and has been from time to time augmented by additional works; and a dockyard has been established, which has given increased importance to the place. In 1798 the mutiny of the fleet at the Nore excited great alarm; and in 1827 the town suffered seriously from a fire, which destroyed forty-five houses, chiefly of wood, and destroyed property to the value of 50,000*l*.

The town consists of three parts—Sheerness proper, including the fortress and dockyards, and the suburbs of Blue-town and Mile-town: an outer line of fortifications comprehends Blue-town within its enclosure, but not Mile-town. The place has been much enlarged within these last few years, and new streets have been laid out. The streets are generally paved, and lighted and cleansed under local acts of parliament. The 'garrison' or fortress occupies the extreme point of the island; the principal batteries front the Thames. The dockyard was originally designed for the repair of vessels which had been injured by any sudden accident; and for the building of ships of war of smaller size, such as frigates and fifth and sixth rates; but it has been improved and extended at a heavy expense since the peace, and is now one of the finest in Europe. The wharf fronts the Medway. The yard is surrounded by a well-built brick wall, and has docks sufficiently capacious to receive men-of-war of the first class. There are a fine basin with 26 feet of water in depth, and two smaller basins; an immense storehouse, victualling-storehouse, mast-house, rigging-house, sail-loft, smitheries, &c.; together with a navy pay-office, and residences for the port-admiral, the commissioner, and other principal officers of the establishment. The whole occupies an area of 60 acres. Blue-town is close outside the dockyard wall, on the south side, and Mile-town is more distant to the south-east.

There is a handsome chapel just close to the dock-gates, the appointment to which is in the Board of Admiralty; and a new church of Gothic architecture in the town; there are several places of worship for dissenters. The trade of the town is chiefly dependent on the dockyard; but some shipments of corn and seed, the produce of the island, are made to London; and the oyster fishery is prosecuted on the adjacent shore in the creeks. There are copperas-works at no great distance. Saturday is the market-day. The population is very dense; that of Sheerness proper was, in 1831, only 61; but the parish of Minster, in which Blue-town and Mile-town are included, had 1430 houses inhabited by 1695 families, 76 houses uninhabited, and 13 building, with a population of 7922, the greater part of which by far was in the two towns. This population is exclusive of the troops in garrison, and, we presume, of the convicts employed in the dockyard. Some years since there were a number of families residing in the old ships of war which had been stationed as breakwaters along the shore. They had chimneys raised of brick from the lower-deck.

The living of Minster is a perpetual curacy in the deanery of Sittinghourne and archdeaconry and diocese of Canterbury, of the clear yearly value of 169*l*., with a glebe-house: the minister presents to the perpetual curacy of the district church at Sheerness.

The whole parish contained, in 1833, an infant school partly supported by subscription, with 160 children, 86 boys and 74 girls; twenty infant or dame schools, with about 200 children of both sexes; an endowed day-school, with 12 boys; a free school in the poor-house, with 10 boys and 12 girls; a proprietary school, with 38 boys; twenty-three other day-schools (including three boarding-schools), with 637 children, 368 boys and 269 girls; and three Sunday-schools, with 992 children, 483 boys and 509 girls.

SHEFFIELD is situate in the district of Hallamshire, in the upper division of the wapentake of Strafforth and Tickhill in the West Riding of the county of York. It is in the southern part of the West Riding, being only one mile and a half distant from Derbyshire, 33 miles south of Leeds, 50 miles south-west of York, and 163 miles north-north-west of London. The name is derived from the Sheaf, one of the rivers on which the town is situated, and 'field.'

Sheffield became a parliamentary borough and acquired the privilege of returning two members under the Reform Act. In population and commercial importance it is the second town of the county. It lies at the eastern foot of that extensive range of hills which form a huge back-bone running along the centre of the island from Staffordshire to Westmoreland; and it occupies and is now spread over various uneven but gradually subsiding tongues of land lying between the Porter, the Rivoling, the Loxley, the Sheaf, and the Don, which, rising from various points of the mountainous range, here unite their waters into one considerable river, the Don, which hence pursues a more steady course through the level country to Doncaster. With the exception of the single level outlet towards Doncaster, it is encompassed and overlooked by an amphitheatre of hills—some verdant, some wooded, and some in the distance with a clear outline of blue heath. The neighbourhood indeed presents a variety and beauty of prospect which can seldom be met with so near a large manufacturing town. The parish of Sheffield comprises the six several townships of Sheffield, Ecclesall Bierlow, Upper Hallam, Nether Hallam, Brightside Bierlow, and Attercliffe-cum-Darnall, and contains an area of rather more than 22,000 acres: the parliamentary borough is co-extensive with the parish.

Hallamshire, which, though its limits be not exactly determined, has been considered to include the parish of Sheffield and the adjoining parishes of Handsworth and Ecclesfield, forms a district or liberty, the origin and history of which may be traced back to Saxon, Roman, and even British times, whilst the importance of the town of Sheffield is of comparatively recent date.

The manor of Sheffield however appears in Domesday-hook as the land of Roger de Busli; but the greater part of it was held by him of the Countess Judith, widow of Waltheof the Saxon.

At what period or how it passed into the family of De Lovetot is uncertain; but it is found to be in their possession in the early part of the reign of Henry I. The Lovetots selected this part of their extensive possessions for their baronial residence, and promoted the interests and aided the industry of their tenants. They founded an hospital, called St. Leonard's (suppressed in the reign of Henry VIII.), upon an eminence still called Spital Hill, established a corn-mill, and erected a bridge over the river Don, then and still called the Lady's Bridge, from the chapel of the Blessed Lady of the Bridge, which had previously stood near the spot; and by their exertions and protection fixed here the nucleus of a town, which the natural advantages of the locality afterwards sustained and swelled into importance. The male line of the Lovetots became extinct by the death of William de Lovetot, leaving an infant daughter, Maud, the ward of Henry II. His successor, Richard, gave her in marriage to Gerard de Furnival, a young Norman knight, who by that alliance acquired the lordship of Sheffield. There is a tradition that King John, when in arms against his barons, visited Gerard de Furnival, who espoused his cause, and remained with him for some time at his castle in Sheffield.

On 12th Nov. 1296, King Edward I. granted to Thomas, lord Furnival, a charter to hold a market in Sheffield on Tuesday in every week, and a fair every year about the period of Trinity Sunday. This fair is still held on the Tuesday and Wednesday after Trinity Sunday, and another fair on the 28th of November. The same Lord Furnival, in 1297, granted a charter to the town, the provisions of which were of great liberality and importance at that period, viz. that a fixed annual sum should be substituted for the base and uncertain services by which the inhabitants had hitherto held their lands and tenements, that courts-baron should be held every three weeks for the administration of justice, and that the inhabitants of Sheffield should be free from all exaction of toll throughout the entire district of Hallamshire, whether they were vendors or purchasers. Sheffield had about this time acquired a reputation for iron manufactures, especially for faulchion heads, arrow piles, and an ordinary kind of knives called whittles. Chaucer thus describes the appearance of the miller:—

> 'A Shefeld thwytle bare he in his hose,
> Roude was his face, and camysed was his nose.'

In no situation indeed could such manufactures have been expected more naturally to arise; iron-ore, stone, and coal were found here in great abundance. The upper bed of coal immediately under a part of the town has long been exhausted, but the pits now working are very near; and in 1841 a lower and thicker bed of coal was reached, and is now in course of working, which comes up to the mouth of the pit in the very town itself. To these local products of iron-stone and coal, the several mountain streams which unite at or near the site of the town became afterwards, and still are, an important auxiliary in the process of manufactures; from them an extent of water-power is obtained, which probably few other localities could furnish; and the present manufactures of the place became thus permanently settled here before the introduction of steam, which has since been employed to sustain and carry them forward.

Another only daughter and another Maud caused by her marriage the transfer of the lordship of Sheffield to the more noble family of Talbot, earl of Shrewsbury. William, lord Furnival, died 12th April, 1383, at his house in Holborn, where now stands Furnival's Inn, leaving an only daughter, who married Sir Thomas Nevil, and he, in 1406, died, leaving an only daughter, Maud, who married John Talbot, earl of Shrewsbury, a soldier and a statesman of considerable reputation. George, the fourth earl of Shrewsbury, built the lodge called Sheffield Manor, on an eminence a little distance from the town, and he there received Cardinal Wolsey into his custody soon after his apprehension. It was on his journey from Sheffield Manor up to London, in order to attend his trial, that the Cardinal died at Leicester abbey. The same place acquired a greater celebrity in the reign of Elizabeth, by the imprisonment there of Mary Queen of Scots. This ill-fated lady was committed by the Queen to the custody of George, sixth earl of Shrewsbury. After being for some time confined in the castle of Tutbury in Staffordshire, she was, in 1570, removed to Sheffield castle, and shortly afterwards to the Sheffield manor-house. She left Sheffield in 1584, and consequently spent fourteen years of her imprisonment in this neighbourhood. It was for the alleged intention of removing her hence, that Thomas, duke of Norfolk, suffered on the scaffold; and it is remarkable that the grandson of this duke of Norfolk, at whose trial and condemnation the Earl of Shrewsbury presided as high steward, afterwards married the grandaughter of the earl, and thereby became possessed of this castle and estate.

Francis, fifth earl of Shrewsbury, obtained from Queen Mary a charter *restoring* to the church burgesses certain property (which had been sequestered in the previous reign of Edward VI.) upon the original trusts for the benefit of the church and town, and creating them a body corporate.

About this period occurred a circumstance which added skilful artizans to this aptitude of site and natural products. The duke of Alva had caused many artizans to emigrate from the Netherlands into England, where they were well received by Queen Elizabeth, and the general rule was adopted of settling all of one craft in one spot; the workers in iron were, by the advice of the queen's chamberlain, the earl of Shrewsbury, settled on his own estate at Sheffield, and the neighbourhood from this time became known for the manufacture of shears, sickles, knives of every kind, and scissors.

Gilbert, the seventh earl of Shrewsbury, and the last of the male line of the house of Talbot who inherited the Hallamshire estates, died on 8th May, 1616, leaving three daughters and coheiresses. The lady Alethea Talbot, the youngest, married the earl of Arundel, and the other two dying without issue, the entirety of the Sheffield estates vested, in 1654, in her grandson, Thomas Howard, earl of Arundel, who, on the restoration of Charles II., was restored to the title of duke of Norfolk, forfeited by his ancestor in the reign of Elizabeth. Sheffield about this time (by a survey in 1613) contained about 2207 inhabitants, of whom the most wealthy were '100 householders which relieve others, but are poore artificers, not one of whom can keep a team on his own lande, and not above ten who have grounds of their own which will keep a cow.' In 1624 an act of incorporation of the cutlers was passed, entitled 'An Act for the good order and government of the makers of knives, sickles, shears, scissors, and other cutlery wares in Hallamshire and parts near adjoining.'

In the contest between Charles I. and his parliament, the town became on more than one occasion the theatre of war, and consequently experienced its casualties. Sir John Gell, with troops from Derbyshire, took military possession of the town and castle; but the duke of Newcastle, at the head of the royal army, having taken Rotherham by storm, and marching forward to Sheffield, the parliamentarians fled into Derbyshire. The people of Sheffield submitted to the royal army, and a garrison was left in the castle under the command of Major Thomas Beaumont, who held the town and castle till, on 1st August, after the battle of Marston Moor, in 1644, the earl of Manchester despatched 12,000 parliamentary infantry to attack the castle of Sheffield. After a siege of some days the castle was obliged to capitulate, on 10th August, 1644. It was then demolished by order of parliament, and though some attempts were afterwards made to restore it, there are no vestiges of it remaining above ground; but the names of Castle hill, Castle green, and Castle folds, still mark its site. The earl of Arundel, who had been of the royal party, retired to the Continent, and his estates at Sheffield were seized by the parliament, but restored in November, 1648, on payment of 6000*l*. as a composition. The Manor did not suffer from these hostilities, but continued to be the occasional residence of its noble owner, and afterwards of his agent, till, in 1706, Thomas, duke of Norfolk, ordered it to be dismantled; 'the park' ceased to be such except in name, its splendid and even far-famed timber was felled, and its wide range of undulating hill and dale divided into farms. The district however still retains its antient names, and even a populous and increasing portion of the town itself on the east side of the river Sheaf is yet called 'the park.'

Though Sheffield maintained its staple manufactures, it did not during the seventeenth century increase much in commercial importance. The manufacturers were men of very small means; they were without water conveyance to either the eastern port of Hull or the western port of Liverpool; pack-horses were the usual means of transit for their heavy goods; and such a character as a merchant or trader to foreign countries was altogether unknown amongst them. It was with the eighteenth century that the business of the town began rapidly to improve. In 1700 the town-hall was built, where the town business was transacted and the sessions held. In the early part of this century an Act was obtained for making the river Don navigable up to Tinsley, within three miles of Sheffield; and the work was completed in 1751. It was not however till 1819 that the water communication was continued through these three miles by the opening of the Sheffield and Tinsley canal. The new church of St. Paul's was erected in 1720; and during this century the art of silver-plating was invented by Thomas Bolsover, an ingenious mechanic, and extensively applied a few years after by Mr. Joseph Hancock.

The introduction of this manufacture speedily gave rise to the invention of a compound called Britannia Metal, in imitation of it. A silk-mill was also erected in 1758, and subsequently cotton-spinning was carried on upon the same premises; but though perseveringly continued in spite of two conflagrations, this trade did not appear to thrive, and has now been for some time entirely abandoned, and the mill is converted into an excellent workhouse. In the same year (1758) lead-works were established on the river Porter, which are still in operation.

In 1750 Mr. James Broadbent first entitled himself to the style of merchant by opening a direct trade to the Continent, and the example was soon followed. Attention was now also turned to the formation or improvement of roads, and the establishment of convenient and regular means of communication with the chief marts of commerce. A stage coach first started from Sheffield to London in 1760, a stage waggon having been on the road a few years previous; and in 1762 the first bank was opened in Sheffield by Mr. Roebuck. The duke of Norfolk, under the authority of an Act of Parliament obtained in 1784, erected the present suite of shambles and other market buildings; and towards the close of this century reservoirs were formed in the neighbouring hills whence to distribute water for the regular supply of the town. The machinery employed in the manufactures had hitherto been propelled by water only; in 1786 the ingenuity of Mr. William Dunn suggested the application of steam-power to the purposes of grinding, and the first steam grinding-wheel was erected in 1786.

In the beginning of the seventeenth century Sheffield was only a large village; it now displays all the features of a manufacturing and commercial community of the first importance, comprising within its parish a population of 110,891. If it present few of the venerable remnants of antiquity, it is one of the most remarkable instances of the rapid progress of industry. But its wealth, though of speedy growth, is not accumulated in a few large masses; it is spread and divided in moderate accumulations amongst a numerous class, and is of a peculiarly steady and substantial quality. In times of financial pressure Sheffield presents fewer instances of bankruptcy, and altogether suffers less than most other towns of equal manufacturing and commercial importance; and from the rare combination and advantages which it possesses for the conduct of its staple manufactures, it can calculate with as much confidence upon its future welfare as perhaps any town in the kingdom.

As to its local government there is none, not even a magistrate resident within the parish. As it increased in population, and its various wants multiplied correspondingly, it adapted itself, from time to time by various means, to the urgency of circumstances. There is a master cutler, who is by common consent and established custom recognised as the head of the town, but the only occasion on which he legally acts as such is in the election of members of parliament for the borough, under an authority so recent as the Reform Act; otherwise he is simply the master or president for the year of the corporation which was established by the Act of 1624 for the good order and government of a particular trade, but was deprived by another Act, passed in 1814, of the principal powers given for that purpose, which became rather injurious than useful, and now exists only for purposes comparatively unimportant. There is a Local Police Act for the better watching, lighting, and cleansing the town, obtained in 1818, and which is now by all acknowledged to be in many respects inefficient, and even its operation is confined to the area lying within a boundary line drawn at the distance of three-quarters of a mile round the parish church, beyond which boundary the town has now stretched itself considerably in many directions. The expenditure under this Police Act is about 5000*l*. a year. The onerous duty of administering justice amongst so large a manufacturing community is discharged by the county magistrates, who attend at the town-hall on Tuesday and Friday in each week for that purpose. Various suggestions have recently been made for the due and improved administration of the affairs of the town, and a petition for a Charter of Incorporation is now pending before the Privy Council.

The situation of the town causes it to be well drained, except in a few confined localities. The streets and buildings do not generally present an opulent or handsome appearance; but from the abundance of excellent stone in the neighbourhood, the former are throughout well pitched and paved. There are very few good dwelling-houses in the town, almost all the merchants and principal manufacturers residing in the country; but within the last few years the shops in the principal streets have assumed generally a much more ornamental front, and various public buildings of some architectural pretensions have been erected. There are six churches in the town of Sheffield, of which two were built in the last century, and three since the commencement of the present one. There is also a church at Attercliffe, one at Darnall, one in Upper Hallam, and one in Nether

Hallam, and a chapel-of-ease at Ecclesall. Chapels for the various bodies unconnected with the establishment are also very numerous; they are generally capacious, but few of them display any architectural ornament.

The public buildings consist of the town-hall, the Cutler's hall, the corn-exchange, recently erected by the Duke of Norfolk, who owns the ground upon which no inconsiderable part of the town is built, and whose liberal conduct in the management of his estates here has been of the utmost advantage to the inhabitants; the fire-office, the assay-office, the assembly-rooms and theatre, the music-hall, two news-rooms, and the public baths, which are a very complete establishment; the cemetery (an extensive piece of ground on the slope of a hill about a mile from the town, laid out for its present purpose with much taste and at considerable expense), and the botanical gardens, which are of considerable extent and for beauty of situation are unrivalled.

Among the charitable institutions are the infirmary, a noble building, near to which fever-wards are now in course of erection; the dispensary, and the Shrewsbury hospital, established and munificently endowed by the Earl of Shrewsbury, pursuant to the will of Gilbert, seventh and last earl of Shrewsbury, who owned the Sheffield estates, and which have been recently re-erected on a new site in a particularly simple yet elegant style of architecture.

The town is well supplied with water, light, and fuel. The competition of two gas companies ensures a cheap and good supply of light.

There are two public bodies which are in possession of property applicable to the benefit and general improvement of the town, viz. the town trustees and the church burgesses. The principal manufacture is that of cutlery in all its branches, indeed of everything that can be fabricated of iron or of steel. The vast buildings used for grinding by steam form one of the curiosities of Sheffield. A peculiar and fatal disease, called the grinder's asthma, is caused by the inspiration of the minute particles of steel and stone thrown off in the rapid process of grinding. So fatal is this disease, that though thousands are so employed, very few grinders are known to survive the age of 45. Various means of diminishing the evil have been suggested, and some adopted, but there is too much inclination among the men to neglect whatever appears to give the least additional trouble, even though death be the penalty of neglect.

Silver-plate and plated-goods form also one of the staple manufactures of Sheffield. Its plated goods have a deserved reputation for strength and durability. Brass-founderies are also numerous. Britannia metal, a superior kind of pewter composed of tin, antimony, and regulus, forms a cheap article of common use and great consumption, the manufacture of which occupies many hands. Latterly a much superior but more costly kind of white metal has been introduced, called German silver. Brushes, buttons, combs, and optical instruments are also made here to a considerable extent; and various other manufactures which arise out of or are connected with the staple commodities of the town, such as cabinet-case makers, engravers, haft and scale pressers and cutters, powder-flask and shot-belt makers, silver-refiners, wood-turners, &c. There are also many mercantile houses, some of which confine themselves to the home markets, while others export to the Continent, to Brazil, the Cape, and various other parts of the world, but far beyond any other in importance, to the United States of America. In a memorial to government on 16th December, 1839, respecting the admission of American flour duty free, it was stated that the Americans were then owing to the manufacturers of Sheffield 600,000*l*.

The following tabular statement of the population of the parish of Sheffield displays a remarkably high ratio of increase between the years 1821 and 1831:—

	1801.	1811.	1821.	1831.	1841.
Males	22,888	26,160	32,446	45,645	54,792
Females	22,888	27,070	32,733	46,047	56,099
Total	45,776	3,230	65,179	91,692	110,891

The number of families in the parish in the year 1831 was 19,998, of whom 14,734 were returned as employed in trades, manufacture, or handicraft, 443 in agriculture, and 4821 either in professional pursuits or unemployed.

The establishments for education and for the diffusion of knowledge are various, and though inadequate to the numbers who need instruction, are perhaps sufficient for those who endeavour to obtain it. Sunday-schools are connected with almost all the places of religious worship. There are also national schools in several districts of the town; a Lancasterian school for about 400 boys, and another for 250 girls; an endowed boy's charity school for 90 boys, and a similar establishment for 70 girls. The foregoing schools are chiefly maintained by subscription. There is also a grammar-school, and a free writing-school where there are 33 free scholars. At a short distance from the town a handsome Gothic building called the Collegiate School has recently been erected by a body of proprietors, and another still larger building on the same side of the town is more recently completed, called the Wesleyan Proprietory school. There is also a Roman Catholic day-school for the poor, and there are several infant-schools, and many private establishments for education.

The Subscription Library has upwards of 7000 volumes; the mechanics' library has 5000 volumes; a literary and philosophical society has been established for many years, and a mechanics' institution for a few years. The medical gentlemen of the town have also established a medical school, and certificates of attendance at its lectures are received by the College of Surgeons in London.

SHEFFIELD. [BUCKINGHAM, DUKE OF.]

SHEHALLIEN. [MASKELYNE.]

SHEIKH. [ARABIA, vol. ii., p. 213.]

SHEKEL (שֶׁקֶל), the principal weight and coin of the Hebrews. The subject of Hebrew weights and money is involved in great obscurity, from the fact that we have no weights or coins of the period before the Captivity. Our only course therefore is to examine the testimonies of antient authors and the extant coins of the period after the Captivity, and then to inquire whether, from the information so gained, we can draw any conclusions respecting the more antient standards.

1. *The Shekel as a Weight.*—The almost uniform testimony of antient authors is that the shekel was equal to the Attic tetradrachm, or to the stater (which was the same thing), or to half the Roman ounce, that is (since the authors referred to lived in the period after Augustus, when 96 denarii went to the pound), to 4 denarii, which were reckoned at the same period equal to four Attic drachmæ. The Septuagint indeed commonly renders the shekel by the didrachm; but the disagreement between this and the other authorities is only apparent, since the drachma of the Septuagint is that current at Alexandria, which was double of the Attic. Hesychius, in one passage, makes it equal to four, and in others to two Attic drachmæ; and Suidas, differing from all other writers, makes it five drachmæ. But the testimony of Hesychius and Suidas is of no value against that of St. Matthew, Josephus, Philo, and the other authorities for the value given above. (See the testimonies examined in Hussey's *Antient Weights and Money*, c. 11.)

The genuineness of the Hebrew coins has been much disputed, but the best numismatists are agreed in rejecting all those which bear inscriptions in the modern or Chaldee character, while they consider those genuine that have inscriptions in the Samaritan or old Hebrew character. The average weight of the shekels of Simon Maccabæus is about 218 English grains, which is about equal to half the English avoirdupois ounce, and only 2 grains more than the Roman ounce, or the weight assigned to the shekel by antient writers. But the full weight of the Attic tetradrachm, to which the shekel is said to have been equal, was 266 grains. The best explanation of this discrepancy is that given by Mr. Hussey, who remarks that we are not to look to the full Attic drachma of the time of Pericles or Xenophon, but to the reduced one under the Roman emperors, which was always considered as equivalent to the denarius.

With respect to the shekel of the time before the Captivity, we have no certain information. The Rabbins say that after the Captivity all weights were increased by one-fifth; but there are many circumstances which prove this tradition to be of no value. On the contrary, from the separate state in which the Jews still remained during the Captivity, and from the tenacity with which they clung to all their antient usages, it is most probable that they preserved their standards of weight and measure during that period. Besides, many of the sacred vessels restored to them by Cyrus were probably of known weight, and those would determine the true standard of the shekel. On the whole, in the absence of trust-worthy information to the contrary, it is most probable that the antient and the modern shekel were of the same weight, namely, about 218 grains.

The shekel formed the foundation of the Hebrew weights, of which there were three principal denominations: the shekel (שֶׁקֶל), meaning *weight*; the maneh (מָנֶה), *number*, that is, a certain number of shekels or weights; and the kikkar (כִּכָּר), *a round number*, or *sum total*, that is, a certain collection of manehs. The last weight is commonly translated by the word 'talent' in the Septuagint, Vulgate, and modern versions. There is a remarkable resemblance between this system and that of the Greeks, the shekel, maneh, and kikkar corresponding respectively to the stater, mina, and talent. The words *maneh* and *μνᾶ* are apparently the same, and *shekel* and *στατὴρ*, have the same meaning, the only difference being that whereas the Hebrew unit was the shekel, the Greeks took for their unit not the stater, but the drachma, which was a fourth of it. There is another weight mentioned in the Bible called adarkon (אֲדַרְכֹּן) or darkomon (דַּרְכְּמוֹן), which seems to have been used for gold only, and is only mentioned in the later books, Chronicles, Ezra, and Nehemiah. Of its value we know nothing more than that it was probably less than three-tenths of the shekel. Some writers consider it to be only the Hebrew form of the Persian coin daricus; but Mr. Hussey, with more probability, takes it to be an antient Hebrew weight, corresponding to the Greek *δραχμὴ*, with which word the name *darkemon* may be connected. (Hussey, *On Ant. Weights, &c.*, p. 178-183.)

The kikkar was equal to 3000 shekels. (*Exod.*, xxxviii. 25.) There is a difficulty about the maneh, since from 1 *Kings*, x. 17, compared with 2 *Chron.*, ix. 16, it would seem to have contained 100 shekels, while in *Ezekiel*, xlv. 12, it is ordered to contain 60 shekels. There are great difficulties in adopting the former value, and on the other hand the meaning of the passage in Ezekiel is very doubtful. If the latter value be adopted, the kikkar would contain 50 manehs. The shekel was subdivided into the beka (בֶּקַע, *half*), or half-shekel, the reba (רֶבַע, *quarter*), or quarter-shekel (the zuz or zuza of the Talmudists), and the gerah (גֵּרָה, *a kind of bean*), or the twentieth of the shekel. The following table therefore represents the Hebrew weights:—

Name.	Value in Shekels.	Value in English Avoirdupois Weight.		
		lbs.	oz.	grs.
Gerah . .	0$\frac{1}{20}$	0	0	10·94
Reba or Zuza .	0$\frac{1}{4}$	0	0	54·71
Beka . .	0$\frac{1}{2}$	0	0	109·43
Shekel . .	1	0	0$\frac{1}{2}$	
Maneh . .	60?	1	14	
Kikkar or Talent .	3000	93	12	

There appear however to have been at least two standards of the shekel, the *shekel of the sanctuary* and the *royal* or *profane shekel*. (*Exod.*, xxx. 13; 2 *Sam.*, xiv. 26.) The former was used in calculating the offerings to the Temple, and all other sums connected with the sacred law; the latter, for the tribute and civil payments. Michaelis and Winer think that the shekel used in commercial transactions was different from both these, but there seems to be no sufficient ground for this opinion. We do not know the relative value of the two standards. The tradition of the Rabbins is that the shekel of the sanctuary was double the profane shekel. Michaelis gets at the proportion by comparing the passages in *Kings* and *Ezekiel* quoted above, understanding the former of the profane shekel, and the latter of the shekel of the sanctuary. This process gives 100 : 60 or 5 : 3 for the ratio of the shekel of the sanctuary to the profane shekel.

2. *The shekel as a coin.* It is scarcely worth while to discuss the question whether the Jews had money of their own before the Captivity. The presumption certainly is that they had, considering the state of civilization among them. In the earliest mention of money in the Bible (*Gen.*, xxiii. 16) the shekels of silver which Abraham paid to Ephron seem, from the expression 'current money with the merchant,' to have been impressed with some mark, which made it *coin*, of however rude a description. (Hussey, c. 12.) The currency of the Jews from the earliest ages was silver, and the word *silver* is the common Hebrew name for money. Brass money is not mentioned in the Bible. Gold money is first mentioned in David's reign (1 *Chron.*, xxi. 25), and by the time of Isaiah it seems to have been common (*Isaiah*, xlvi. 6). The proportion of the value of gold to that of silver among the Jews is very uncertain. Bochart, from comparing 2 *Sam.*, xxiv. 24, with 1 *Chron.*, xxi. 25, makes it 12 to 1 in David's time; but this computation rests on very slender grounds. The conjecture, derived from 2 *Kings*, xviii. 14, that it was 10 to 1 in Hezekiah's time, seems not improbable.

The earliest Jewish coinage of which we have historical knowledge was that of Simon Maccabæus (1 *Macc.*, xv. 6), which was in silver, and of which several specimens remain. The denominations of the Hebrew money were the gerah, or twentieth of the shekel, which the Septuagint renders by *ὀβολός*, but which is nowhere expressly mentioned as a coin; the reba, or quarter-shekel (1 *Sam.*, ix. 8); the third part of a shekel is mentioned by Nehemiah (x. 32), but it is not clear that there was a coin of this value; the beka, or half-shekel, which was the poll-tax paid by every Israelite when the census was taken (*Exod.*, xxx. 15); the shekel, which appears to have been the largest coin in use, though some understand the amounts of 15, 20, and 25 shekels, mentioned in the passage of *Ezekiel* already quoted, to mean coins of that value; the maneh, and the kikkar or talent, were respectively sums of 60 shekels (though this, as already observed, is uncertain), and of 3000 shekels.

The worth of the shekel in our money depends of course upon the quality of the silver, which, for the earlier periods at least, cannot be ascertained. For the later periods, if we assume that the standard was about the same as that of the Roman money, namely, $\frac{1}{10}$th of the weight alloy, the shekel of half an avoirdupois ounce would be equivalent to 210·983 grains of pure silver, or $\frac{210·983}{80·7}$ of a shilling, that is, to 2*s.* 7*d.* 1·49 farthings. According to this calculation, the following table represents the value of the Hebrew money:

				£	s.	d.	farthings.
Gerah	=	$\frac{1}{20}$ shekel	=	0	0	1	2·27
Reba	=	$\frac{1}{4}$,,	=	0	0	7	3·36
Beka	=	$\frac{1}{2}$,,	=	0	1	3	2·72
Shekel	=		=	0	2	7	1·49
Maneh	=	60 shekels	=	7	16	10	·8
Kikkar or Talent	=	3000 shekels	=	396	5	10	

(Hussey, *On Antient Weights and Money*; Winer's *Biblisches Realwörterbuch*, art. 'Sekel;' Calmet's *Dictionary*; Jahn's *Archäol. Bibl.*; Jennings's *Jewish Antiquities.*)

SHEKI. [GEORGIA.]

SHELBURNE, LORD. [GEORGE III.]

SHELDON, GILBERT, archbishop of Canterbury, was born July 19, 1598, at Stanton in Staffordshire. He received the name of Gilbert from his godfather Gilbert, earl of Shrewsbury, to whom his father Roger Sheldon was then a menial servant, although descended from an antient Staffordshire family. In the latter end of the year 1613 he was admitted into Trinity College, Oxford; November 27, 1617, he took the degree of Bachelor of Arts, and that of Master, May 28, 1620. He was elected fellow of All-Souls College in 1622; and about the same time taking holy orders, he became afterwards domestic chaplain to Thomas, lord Coventry, keeper of the great seal, who gave him a prebend of Gloucester; and finding him to be a man of parts, recommended him to king Charles I. as a person well versed in political affairs. On the 2nd of May, 1633, he was presented by his majesty to the vicarage of Hackney in Middlesex. He was also rector of Ickford in Buckinghamshire, and archbishop Laud gave him the rectory of Newington in Oxfordshire. Having proceeded Bachelor of Divinity, November 11, 1628, he took the degree of Doctor in Divinity June 25, 1634.

In March, 1635, Sheldon was elected warden of All-Souls College; and being esteemed a learned man, he was appointed chaplain in ordinary to the king; he became afterwards clerk of his closet, and was designed by him to be made master of the Savoy Hospital and dean of Westminster, but the civil wars which ensued prevented those promotions. During these he adhered firmly to the king, and was one of the chaplains whom his majesty sent for to attend his commissioners at the treaty of

Uxbridge, in February, 1644, where he argued so earnestly in favour of the church of England as to draw upon him the envy and resentment of the parliamentarians, which they made him afterwards sufficiently feel. He attended the king at Oxford, and was witness to the following remarkable vow made there by his majesty, which was preserved by archbishop Sheldon thirteen years underground, and first published by Echard, in the Appendix to his 'History of England,' p. 5. 'I do here promise and solemnly vow, in the presence and for the service of Almighty God, that if it shall please the Divine Majesty, of His infinite goodness to restore me to my just kingly rights, and to re-establish me in my throne, I will wholly give back to His church all those impropriations which are now held by the crown, and what lands soever I do now or should enjoy, which have been taken away either from any episcopal see or any cathedral or collegiate church, from any abbey or other religious house. I likewise promise for hereafter to hold them from the church, under such reasonable fines and rents as shall be set down by some conscientious persons, whom I propose to choose with all uprightness of heart to direct me in this particular. And I most humbly beseech God to accept of this my vow, and to bless me in the design I have now in hand; through Jesus Christ our Lord. Amen. Charles R., Oxford, April 13, 1646.'

He also attended, in 1647, as one of his majesty's chaplains at Newmarket and other places. The 30th of March he was ejected from his wardenship of All-Souls College by the parliamentary visitors, who forcibly took possession of his lodgings, April 13, and imprisoned him, with Dr. Hammond, in Oxford and elsewhere. He remained confined above six months, and then the Reforming Committee set him at liberty, October 24, 1648, upon condition that he should never come within five miles of Oxford; that he should not go to the king in the Isle of Wight; and that he should give security to appear before them at fourteen days' warning whenever cited. Upon his release he retired to Snelston in Derbyshire, and lived among his other friends in Staffordshire and Nottinghamshire, whence, from his own purse, and from collections made by him amongst the royalists, he sent constant supplies of money to king Charles II. abroad, and followed his studies and devotions until the approach of the Restoration.

Upon the death of Dr. Palmer (March 4, 1659-60), he became again warden of All-Souls, without however taking possession, and continued so till the January following. On king Charles II.'s return, he met his majesty at Canterbury, and was soon after made dean of the chapel royal; he was also, upon bishop Juxon's translation to Canterbury, advanced in his room to the bishopric of London, and consecrated October 28, 1660. He also obtained the mastership of the Savoy, which he kept till 1663; and it was at his lodgings there that, in 1661, the famous Conference was held between some of the Episcopal clergy and Presbyterian divines concerning alterations to be made in the Liturgy, which thence came to be distinguished by the name of the 'Savoy Conference.' His conduct there and afterwards is much blamed by the Presbyterians, and it certainly appears to have been anything but conciliating. As some excuse however for any unnecessary severity that he may have exercised, it is but fair to remember the injuries and sufferings that he had himself undergone. He rejected the proposal of an amicable conference, and told the Presbyterian divines, 'That not the bishops, but *they* had been seekers of the Conference, and desired alterations in the Liturgy; and that therefore there was nothing to be done till they had brought in all they had to say against it in writing, and all the additional forms and alterations which they desired.' During the course of that Conference he did not appear often, and did not engage in all the disputation, and yet was well known to have a principal hand in disposing of all such affairs.

In 1663 he was translated to the archbishopric of Canterbury, vacant by the death of archbishop Juxon. In 1665, during the time of the Great Plague, he firmly continued at Lambeth, notwithstanding the extremity of the danger, and with his diffusive charity preserved great numbers alive that would otherwise have perished. Also by his affecting letters to all the bishops he procured great sums to be returned out of all parts of his province. The same year he was one of those who promoted the Corporation or Five-Mile Act. On the removal of Lord Clarendon from the chancellorship of the university of Oxford he was chosen to succeed him, on December 20, 1667, but resigned that office the 31st of July, 1669. He had before honourably lost the king's confidence by advising him to put away his mistress Barbara Villiers, and never recovered it. He soon after retired from public business, and for the last years of his life he resided chiefly at his palace at Croydon. He died at Lambeth, November 9, 1677, in the eightieth year of his age; and, according to his own direction, was buried in Croydon church in Surrey, where a stately monument was soon after erected to his memory by his nephew and heir Sir Joseph Sheldon, who had shortly before been lord-mayor of London, son of his elder brother Ralph Sheldon, of Stanton in Staffordshire.

Dr. Sheldon's character has been represented with the discordance that must be expected in the reports of contending parties. Dr. Samuel Parker, bishop of Oxford, who had been his chaplain, says in his 'Commentarii de Rebus Sui Temporis,' that 'he was a man of undoubted piety; but though he was very assiduous at prayers, yet he did not set so great a value upon them as others did, nor regarded so much worship as the use of worship, placing the chief point of religion in the practice of a good life. In his daily discourse he cautioned those about him not to deceive themselves with a half religion, nor to think that divine worship was confined within the walls of the church, the principal part of it being without doors, and consisting in being conversant with mankind. He had a great aversion to all pretences to extraordinary piety, which covered real dishonesty, but had a sincere affection for those whose religion was attended with integrity of manners.' Bishop Burnet, in his 'History of his own Time,' does not give him so favourable a character. He says that he was a very dexterous man in business, had a great quickness of apprehension, and a very true judgment, but thinks he engaged too deeply in politics. 'He had an art, that was peculiar to him, of treating all that came to him in a most obliging manner; but few depended much on his professions of friendship. He seemed not to have a deep sense of religion, if any at all; and spoke of it most commonly as of an engine of government and a matter of policy.' In public spirit and munificence he sustained after an exemplary manner the character of a great prelate; and it is chiefly on this account that his name will be handed down to posterity with the highest honours. He expended large sums upon the Episcopal houses of the sees of London and Canterbury, and particularly the palace at Lambeth, where he rebuilt the library and made additions to its contents. At Oxford, besides several sums given to different colleges, he immortalised his bounty to that University by the erection at his sole expense of the celebrated theatre which bears his name. The architect employed was Sir Christopher Wren; the building was completed in about five years, and was opened with great solemnity, July 9, 1669, before the vice-chancellor, heads of houses, &c. The expense of this building was more than fourteen thousand pounds, and he bequeathed 'two thousand more, to be employed,' says Wood, 'in buying land, whose revenue might support the fabric, and the surplusage be applied to the learned press.' In this theatre are held public meetings of the University for the annual commemoration of the benefactors and the recitation of prize compositions, and occasionally for conferring degrees on distinguished personages; sometimes also public concerts are performed in it. In short, we are assured that from the time of Sheldon's being bishop of London to that of his death, it appeared in his book of accounts that upon public, pious, and charitable uses he had bestowed sixty-two thousand pounds; according to others, he disposed to public pious uses, in acts of munificence and charity (in his life or by his last will and testament), the sum of seventy-two thousand pounds. As a writer he is only known by 'A Sermon preached before the King, at Whitehall, upon June 28, 1660, being the day of Solemn Thanksgiving for the Happy Return of his Majesty, on Psalm xviii., 49,' London, 1660, 4to. (*Biogr. Britann.*)

SHELDRAKE, one of the English names for the *Anas Tadorna* of Linnæus, *Tadorna Vulpanser* of Leach and others.

Description.—Male.—Head and neck of sombre green or greenish-black. Lower part of the neck, coverts of the wings, back, sides, rump, and base of the tail, pure white. Scapulars, a large band girding the middle of the belly, abdomen, quills, and extremity of the caudal feathers, deep black. A large bay-coloured gorget adorns the breast, and rises to the upper part of the back. Beauty-spot on the wing purple-green. Lower coverts of the tail bay. The bill, and the fleshy protuberance or knob at the base of the bill, blood-red. Feet of a flesh-colour. Irides brown. Length upwards of two feet. Weight two pounds and a half and upwards.

Female.—Smaller than the male. No fleshy protuberance at the base of the bill, but, in its stead, a small whitish spot. All the colours more obscure. The bay-coloured band less, and that which girds the belly very narrow, often marked with large white spots.

Young of the Year.—Forehead, face, front and lower part of the neck, back, and lower parts white. Head, cheeks, and nape brown, dotted with whitish. Breast very bright reddish. Scapulars blackish ash, bordered with bright ash. Lesser coverts of the wings white, bordered with ash. Tail terminated with ashy-brown. Bill reddish-brown. Feet livid ash-colour.

This elegantly-marked duck is the *Tadorne* of the French, and is not badly described in the old quatrain·

'Cest oyseau cy est appellé Tadorne
Que rarement se voit en nostre France:
Plus qu' un Grisard est gros en corpulence,
Ses couleurs sont blanc, noir, roux, pale, et morne.'

It is supposed to be the *Chenalopex* of Pliny and of Herodotus (*Nat. Hist.*, x. 22): it is the *Jugas* of the Swedes; *Brand-Gaas* and *Grav-Gaas* of the Danes; *Ring-Gaas, Fager-Gaas, Ur-Gaas*, and *Rodbelte* of the Norwegians; *Hav-Simmer* of the Feroe Islanders; *Avekong* of the Icelanders; *Kracht-Ente* and *Brandente* of the Germans; *Die Höcker Kusten und Ufer Brandgansente* of Brehm; *Grafgas* of Nillson (*Skand. Faun.*); *Volpoca* of Savi and 'Stor. degl. Ucc.;' *Hwyad yr eithin* and *Hwyad fruith* of the antient British.

The provincial names among the modern British are very numerous, and one of them alludes to its reputation for cunning, which, if it be the bird mentioned by the Greeks and Romans, gave it, most probably, its antient appellation. It is called in different parts of Britain *Bargander, St. George's Duck, Burrow Duck*, and *Burrough Duck; Sly Goose, Sheel Duck*, and *Skeeling Goose.*

Food, Habits, &c.—This species may often be seen about our tidal rivers (we have often watched it feeding on the mud-banks of the Severn). Its food consists of small testaceous mollusks, bivalves principally, small fish, fry of fish and spawn, small crustaceans, and marine plants. Pennant says, 'These birds inhabit the sea-coasts, and breed in rabbit-holes,' hence their name *Burrow Duck.* 'When a person attempts to take their young, the old birds show great address in diverting his attention from the brood; they will fly along the ground as if wounded, till the former are got into a place of security, and then return and collect them together. From this instructive cunning, Turner, with good reason, imagines them to be the *chenalopex* or *fox-goose* of the antients; the natives of the Orkneys to this day call them *sly goose.*' The nest is not always formed in burrows. Where there is not this convenience, the sands and fissures and cavities of rocks are made the place of nidification. The eggs, ten or twelve in number, are of a pure white. Sheldrakes may be domesticated, and are pretty ornaments in poultry-yards; but are apt to fly away if not pinioned. They have been known to breed, but very rarely, in captivity. Their flesh is rank and altogether bad.

Geographical Distribution.—The north and the western countries of Europe along the sea-coasts. Very abundant in Holland and on the coasts of France:* accidentally, during its passage, in Germany and on the rivers of the interior. The birds from Japan are identical with those of Europe. (Temminck.)

SHELL. The hard calcareous substance which protects either partially or entirely the testaceous mollusks externally, or supports certain of them internally, is termed *shell.*

This substance, when external, may be considered as the exo-skeleton of the animal; when internal, as its endo-skeleton.

The common or waved welk of our shores (*Buccinum undatum*) [ENTOMOSTOMATA, vol. ix., p. 454], and the common oyster (*Ostrea edulis*), may be taken as examples of external shells; and the internal support, or cuttle-bone, as it is generally called, of the common cuttle-fish (*Sepia vulgaris*) [SEPIADÆ, ante, p. 254], affords an example of an internal shell; for it is not bone, though so termed, but true shell.

Structure.—Shells are either crystalline or granular, according to Mr. Hatchett, who proposed this division in his interesting papers containing his Experiments on Shell and Bone (*Phil. Trans.*), vol. 89 (1799), and his Experiments on Zoophytes (*Phil. Trans.*), vol. 90 (1800).

Crystalline Shells.—The Porcellaneous shells—take a common Cowry (*Cypræa Tigris*) as an example—are crystalline shells.

Crystalline shells are either *rhombic* or *prismatic.*

Those of the *rhombic* crystalline structure, observes Mr. Gray, in his valuable paper On the Economy of Molluscous Animals and on the Structure of their Shells (*Phil. Trans.*, 1833), exhibit, on fracture, three distinct layers of calcareous matter. The cubic pieces into which spiral univalves generally break, mostly present, on two of the fractured sides, flat surfaces on the inner and outer edges, separated from each other by a shelving portion in the centre; and, on the two intermediate broken sides, shelving external and internal edges, connected by a flat central portion, these differences of surface being produced by the different position of the crystals in the different layers. 'Each of the three layers,' continues Mr. Gray, 'thus rendered obvious, is composed of very thin laminæ, placed side by side, as high as the thickness of the plate, and perpendicular to its surface. When these laminæ are minutely examined, they will be found marked with obscure oblique lines, in the direction of which they separate when broken into long narrow rhombic crystals. The lines of cleavage in the succeeding laminæ are placed in contrary directions, so that when two of these plates united are examined under the microscope, the lines of cleavage appear to cross each other at right angles, whilst those of the alternate laminæ follow the same direction. The laminæ of the outer and inner plates are always directed from the apex of the cone of which the shell is formed towards its mouth; in the spiral shells they consequently follow the direction of the spire. On the contrary, the laminæ of the plate situated between the other two, form concentric rings round the cone parallel with its base, and cross at right angles those of the inner and outer layer. This decussation of the laminæ of the plates, and of the crystals of the laminæ themselves, adds considerably to the strength of the shell, and accounts for the great difficulty that is found in breaking many shells of this structure, more especially the cones and olives, in which however nearly the whole of the strength resides in the outer whorl and in the spire. A good illustration of this structure may be obtained by examining with a pocket-glass the fractured edge of a cone [CONUS, vol. vii., p. 485], olive, or other spiral shell, in which the *extremities* of the laminæ of the outer and inner plates, and the *sides* of those of the central layer, or the converse, will be observed, according to the direction of the fracture, the extremities of the laminæ showing the angles of the crystals; while their sides, when closely examined, will often exhibit the crystalline flakes. In order to observe the lines of cleavage, the best mode of proceeding is to bruise part of a shell with a hammer, and to examine the fragments moistened under a microscope, until one is discovered which exhibits two laminæ in conjunction. The plates and their structure are also well seen in the polished surfaces of shells which have been slit or ground down to exhibit the internal structure of their cavity. The relative thickness of the three plates varies in different species; but as far as I have yet examined, the central plate is generally rather the thickest, and the outer one the thinnest. The Italian cameo-cutters appear to be aware of this circumstance, and avail themselves of it in cutting the cameos, the ground being always formed of the innermost layer of the three, which is also generally the most transparent. The layers increase in thickness from their inner to their outer edge, each of them being formed by successive depositions of their coats of animal and calcareous matter on its inner surface, until it acquires the proper thickness for the shell, the outermost edge of which is very thin, and has during the progress of the growth little calcareous matter, but gradually passes into periostracum.'

The glassy or porcelain-like coat of the Olives, &c., is well known, and the outer layer, although it is as crystalline as the rest, is very thin; but it is, as Mr. Gray remarks, harder and much more compact than the others, and between it and the central layer an opake, white, powdery film is deposited, which often causes it to break off in splintery flakes, while the rest of the shell separates into fragments, generally more or less cubical, their shape depending doubtless on the rectangular disposition of the laminæ of which the plates are formed.

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* But see above—the quatrain.

Shells of the *prismatic* crystalline structure are formed of several layers, sometimes, as in the *Pinnæ*, separated from each other. If, however, observes Mr. Gray, the shell be cracked transversely to its layers, the crystals will be found continued across the line which separates them; and he alludes to the analogous structure existing in some minerals, Hæmatite for instance, the balls of which appear to be formed of separate concentric coats; but nevertheless when they are broken, exhibit the crystals radiating from the centre to the circumference without interruption.

If a prismatic crystalline shell be broken, a number of short fibres perpendicular to the surface appear: these, on examination, prove to be hexagonal prisms principally, and interposed among these are a few smaller polyhedral prisms. The tubes of the great Sumatran *Teredo* and *Magilus* are examples of this structure; and the *Mytili*, *Meleagrinæ*, and *Inocerami*, as well as the *Pinnæ*, may be selected with advantage from among the bivalve shells for observing it.

Granular or Concretionary Shells, when fractured, display a texture which is nearly uniform. The plates of which they are formed are very thin, and closely applied to each other; thus making the whole fabric compact and hard. Mr. Gray, after noticing that the pearly or iridescent lustre appears to be confined to shells of this texture, states that he is induced to believe that this lustre depends in great measure on the thinness and number of the *laminæ* of which the shell is formed. The *Placunæ* and *Anomiæ* exhibit this structure throughout their shells, and it is present in the inner or pearly coating of the *Turbines*, *Haliotides*, and *Uniones*, as well as in the *Pinnæ* and *Meleagrinæ*. In some shells of this structure, as Mr. Gray observes, the layers are thicker, and the animal matter is deposited in larger quantities, thus presenting a foliaceous appearance; and in these the calcareous particles are large, opake, white, and earthy, like chalk. The common oyster is a good example of this modification. Mr. Gray remarks that the animal matter between the laminæ is sometimes very unequally deposited, and notices its occurrence in the form of large brown spots in the pearly coat of many of the *Haliotides*, producing beautiful variations in the colouring and pearliness of the shell.

The occurrence of water between the plates of the shell will be more particularly alluded to in the article Spondylidæ.

Chemical Analysis.—Before we proceed to inquire into the component parts of shell, it will be as well to advert to the process employed by Mr. Hatchett in investigating its nature, not only as affording evidence of the value of his tests, but also in order to assist those who wish to pursue the inquiry.

Mr. Hatchett states that when shells were examined, they were immersed in acetous acid, or nitric acid diluted, according to circumstances, with four, five, six, or more parts of distilled water; and the solution was always made without heat. The carbonate of lime was precipitated by carbonate of ammonia or of potash; and phosphate of lime (if present) was previously precipitated by pure or caustic ammonia. If any other phosphate, like that of soda, was suspected, it was discovered by solution of acetate of lead. Bones and teeth were also subjected to the action of the acetous or diluted nitric and muriatic acids. The dissolved portion was examined by the above-mentioned precipitants; and in experiments where the quantity of the substance would permit, the phosphoric acid was also separated by nitric or sulphuric acid. The phosphoric acid thus obtained was proved after concentration by experiments which, being usually employed for such purposes, are too well known to require description. He adds that it is necessary moreover to observe that as the substances examined were very numerous, and his principal object was to discover the most prominent characters in them, he did not attempt in general to ascertain minutely the proportions so much as the number and quality of their respective ingredients.

'The greater part, if not all, of marine shells,' says Mr. Hatchett, 'appear to be of two descriptions in respect to the substance of which they are composed. Those which will be first noticed have a porcellaneous aspect, with an enamelled surface, and when broken are often in a slight degree of a fibrous texture. The shells of the other division have generally, if not always, a strong epidermis, under which is the shell, principally or entirely composed of the substance called *nacre*, or mother-of-pearl. Of the porcellaneous shells, various species of *Voluta*, *Cypræa*, and others of a similar nature were examined. Of the shells composed of *nacre*, or mother-of-pearl, I selected the Oyster, the river Muscle, the *Haliotis Iris*, and the *Turbo olearius*.'

Mr. Hatchett found that in the porcellaneous shells, such as the *Cypræœ*, &c., the animal matter was much less in quantity; and although of a quality which, like a cement or gluten, served to bind and cement the particles of carbonate of lime firmly together, so small was the degree of natural inspissation, and so little advanced was the degree of organization, that when the carbonate of lime was dissolved, even by very feeble acids, little or no vestige of jelly, membrane, or cartilage could be perceived; nor indeed could any be detected but by the small portion of animal coal which was formed when those shells had been exposed for a short time to a low red heat. When he proceeded however from shells of this description to others tending to the nature of nacre, or mother-of-pearl, such as some of the *Patellæ*, a substance was left untouched by the acids which had the appearance of a yellowish transparent jelly, but which was very different from the varieties of animal jelly called gelatin; so that the substance which served merely as a gluten in the porcellaneous shells was not only more abundant in these *Patellæ*, but, being more inspissated, was become immediately visible and palpable. These qualities were more strongly marked in the common oyster; and in the river-muscle, and in the shells composed of the true nacre, or mother-of-pearl, this substance was found not only to constitute a large part of the shell, but even to be more dense, so as no longer to appear gelatinous; and in addition to these, strong and visible marks of organization were stamped on every part, and a perfect membranaceous body remained composed of fibres arranged parallel to each other according to the configuration of the shells. (*Phil. Trans.*)

Mr. Hatchett presented to the Museum of the Royal College of Surgeons in London many of the results of his experiments, and the following preparations may be seen in the *Physiological Series*. No. 94 is one of the valves of the common muscle (*Mytilus edulis*, Linn.) which has been steeped in acid to dissolve and separate the earthy part (carbonate of lime), and show the animal part retaining the membranaceous form. No. 94 A is one of the valves of the fresh-water muscle (*Anadon cygneus*) similarly treated, and with the same results. No. 95 is the shell of an oyster (*Ostrea edulis*) similarly treated, showing the succession of laminæ of animal membrane in and upon which the earthy matter is deposited. No. 96 is the shell of a common snail (*Helix hortensis*) which has undergone the same process. Nothing but the animal part remains, and that still retains in some measure the form of the shell. No. 97 is a specimen of *Limnæa*, which has been subjected very little, if at all, to the action of acid. No. 97 A exhibits two species of *Neritina* treated with acid, but in different degrees. In the specimen at the bottom of the jar very little of the earthy matter remains. No. 98 shows portions of a *Haliotis* which have been treated with acid; and No. 98 A, other portions more completely deprived of the earthy material. No. 98 B is the shell of *Haliotis tuberculata*, part of which only has been steeped in an acid, to show that the animal matter retains the characteristic marks of the shell after the earthy part has been removed. Below this is suspended a portion of mother-of-pearl (*Meleagrina*, probably) similarly treated; and No. 98 C is the membranaceous part of a piece of mother-of-pearl.

Mr. Hatchett remarks (*loc. cit.*) that the wavy appearance and iridescence of mother-of-pearl, as well as pearl, are evidently the effect of their lamellated structure and semitransparency, in which in some degree they are resembled by the lamellated stone called Adularia.

To return to the specimens preserved in the College of Surgeons. No. 99 is the shell of a *Turbo Pica*, with the operculum, which has been partially submitted to the action of an acid. No. 100 exhibits portions of the shell of a *Turbo* which have been submitted to the action of an acid for a longer time, so as to leave little else but the animal matter. No. 100 A is a turbinated shell which has been similarly treated, showing the strong outer epidermis, and the bright nacre or mother-of-pearl substance of which the shell is chiefly composed. No. 100 B exhibits portions of the animal substance of a turbinated shell. No. 103 A shows portions of the tube of a *Teredo gigantea* which have been submitted to the action of an acid, and the proportion of animal matter in that shell; and No. 103 B exhibits portions of the tube of a marine animal similarly treated.

The *cuttle-bone*, as it is erroneously termed, consists of various membranes hardened by carbonate of lime, without the smallest mixture of phosphate. The following preparations were made by John Hunter, many years before the experiments of Mr. Hatchett, and the menstruum employed by the former in separating the earthy from the animal matter was dilute muriatic acid. No. 106, a longitudinal section of the dorsal plate of a cuttle-fish which has been steeped in dilute muriatic acid and deprived of its earthy part to show that the proportion of animal matter that remains is sufficiently well organized and abundant to preserve the form and structure, which are exhibited in Nos. 104 and 105. No. 107 is the outer lamina of the dorsal plate of a cuttle-fish entirely deprived of its earth and dried. In the preceding section, which is the counterpart of this preparation, it is seen *in situ*. No. 108 is the membranaccous constituent of the dorsal plate of a cuttle-fish; and No. 109, a large portion of the membranaceous constituent of the same substance, which shows very distinctly its laminated structure.

Growth.—Although it is true, generally speaking, that shells cover the embryo of the testaceous mollusk in the egg, as observed by Swammerdam, Pfeiffer, and others, such is not its condition in all cases. In *Argonauta*, for instance, the shell is not coeval with the first formation of the animal. [PAPER NAUTILUS, vol. xvii., p. 211.]

Mr. Gray, who states that the shells of Mollusca appear to be coeval with the first formation of the animal, observes that the cephalopodous mollusca form no exception; their bone, composed of two or three calcareous plates, being found fully developed in the cuttle-fish some time before the young animal is hatched. These observations, he adds, are directly at variance with the theory maintained by the late Sir Everard Home (*Phil. Trans.*, 1817), namely, that the shell is formed after the animal has quitted the egg; and, as regards the cuttle-fish, they are opposed to the remark made by Baron Cuvier, that the young cuttle-fish, when first hatched, has only a cartilaginous plate like the *Loligo*.

The shell, when first observed on the embryo (even of the animals of spiral shells) forms, Mr. Gray observes, a short blunt, more or less curved, subcylindrical cone, covering the hinder part of its body: as the organization of the embryo becomes developed, and the hinder part of the body extended, the shell, he remarks, increases in size, till the body and shell together occupy nearly the whole of the egg. 'While in the egg,' says Mr. Gray in continuation, 'the embryo shells are generally of a pale horn colour, and destitute of markings; when therefore they remain attached to the apex of the spire of adult shells, they may be easily distinguished by their appearance from the part formed after their exclusion; and as in such cases they offer some characters of importance, it has been proposed to designate them by the name of the nucleus of the shell. The effect of the atmosphere on the shell is almost instantaneous: in some young *Helices* and in a species of *Voluta* in my collection, the very first line of calcareous matter deposited after their exclusion from the egg is marked nearly as the adult shells of the species.'

The same author remarks that the *nucleus* which forms the original apex in all shells, and frequently remains attached to them during all the periods of their growth, is largest in those shells the animals of which are viviparous, and is consequently very distinct in the *Volutæ*, *Paludinæ*, and *Cyclades*. In the oviparous species, he observes, it agrees in size with the egg of the animal; thus *Achatina octona*, which has an egg nearly equal in dimensions to the mouth of the shell, and *Bulini ovatus* and *bicarinatus*, which lay large eggs, have large nuclei, the magnitude of the nucleus in general rendering the top of the spire blunt. Some, on the contrary, as *Stylina* generally, and *Pupa purpurea*, have, he adds, a very long, slender, acute, turreted nucleus: the form and size of the eggs of these mollusks do not appear to be known.

The nucleus consists of two coats or parts: the external coat or layer, *Epidermis* and *Periostracum* of authors, is of a somewhat horny or membranaceous character: the inner layer constitutes the true shell. This epidermis is thinnest in such shells as are enveloped in the mantles of their animals. The gradual growth of the shell so constituted is effected by the secretion from the mantle. The preparation No. 93 A, in the Museum of the College of Surgeons, exhibits a *Cypræa Tigris* with the soft parts. One of the lobes of the mantle, the secreting organ of the shell, is protruded. There are glands at intervals in the mantle of those shells that are ornamented with coloured patterns in the form of necklaces or stripes, which produce those patterns in many cases with all the correctness of a design. But though the mantle is the ordinary secreting organ, the vitreous external coat giving the highly glazed appearance to which the olives owe so much of their beauty is secreted by the foot, and not by the mantle.

The plates which form the rhombic crystalline shells are, Mr. Gray observes, deposited in succession, each gradually increasing in thickness as the shell enlarges. As the animal waxes in size, the lip gradually shelves, becoming thinner from the inner to the outer edge, the innermost part being formed of three layers, the next of two, and the outer and thinnest part (that which is first formed) of only a single layer. At the approach of the periodical stoppage of the growth of the animal, the second layer of shell, and afterwards the innermost layer, is deposited up to the edge of the mouth, which is thus completed. By this process a spiral shell, a cone for instance, becomes as it were rolled on itself.

But besides this gradual onward increase, another process is called into action in certain cases, in order to the symmetrical growth of the spiral shell. Take a *Triton* or a *Murex* for instance. The intervals of growth are marked by the elevated *varices*. In the direction in which the shell is, so to speak, to be rolled on itself, there will be found a thickened spreading inner lip, into which a varix descends. Now both these must be removed, in order to insure the uninterrupted progress of the shell; for if these shells be examined internally, they will be found to be smooth and uninterrupted, and what is now inside was once outside. The power of absorption then must be great to remove the masses of shell which are contained in the highly elevated and wrought varices, for such in many shells they are, to say nothing of the thickened and patulous lip.

In the smooth shells, cones for instance, where the animal has no obstacle to remove in the enlargement of the shell, the internal volutions are often so much absorbed as to be as thin as paper, and not unfrequently have vanished altogether. In both these cases, may not the animal derive from its own shell the means of increasing it?

The *operculum* would in itself almost justify a treatise, which our limits forbid. It is a horny or shelly plate, which closes more or less completely the aperture of the spiral shell; so that those spiral shells which are so furnished are in fact bivalves. They are developed with the embryo in the egg. We must refer our readers for details to the interesting papers of Mr. Gray, who has for some years paid great attention to this subject. In the *Medical Repository* for 1821 he first urged the importance of this adjunct as a generic and family distinction, and he pursues the subject in the memoir from which we have quoted in this article; nor has the study of this interesting part of the conformation of many testaceous mollusks been neglected by M. de Blainville and other French zoologists, who have followed it out with great assiduity.

The nucleus, spire, and indeed the upper whorls of many shells, of the volutes for instance, and, most especially, of MAGILUS, become, as they advance in growth, filled more or less by a transparent calcareous secretion; and Mr. Gray remarks that the distinction between such shells and those which are decollated, such as *Bulinus decollatus*, *Cerithium decollatum*, &c., is, that in the latter the animal, instead of lining the upper whorls with an internal coat, suddenly withdraws its body from them, and forms behind its extremity a concave septum: the vital communication between the body and the apex of the shell being thus cut off, the latter part, he observes, decays in the manner of a dead shell, and falls off in particles; but M. de Blainville refers the decollation of the spire to the filling up of the inner surface of the cavity of the shell with a very brittle vitreous deposit.

Mr. Gray remarks that in many fresh-water bivalves there is deposited between the layers of the shell a lamina of animal matter, similar to the periostracum; and that in the genera *Etheria* and *Mulleria* such a coat is deposited between nearly all the layers, giving them a very peculiar olive-green colour, and having minute dots on its surface. The erosion of these shells must be familiar to all who are conversant with the subject; and Mr. Gray states that these successive depositions of animal matter enable them to offer a new layer of periostracum for the protection of each succeeding plate, as the plate above it yields to the destructive influence of the medium in which the animal resides. A similar deposit of animal matter is also found, he adds, forming green stains in the pearly inner coat of the various species of *Uniones*, and protects from the action of the water the inner part of the umbones of shells which have been eroded. Mr. Gray has observed the thick inner layer in the upper valve of *Ostrea Cornucopiæ* to be prismatic, and the outer part of the laminæ to be separated by layers of periostracum.

The disintegrated thin, lamellar, pearly grey, silvery scales of iridescent shells, when reduced to powder, may be used as a pigment to imitate the silvery appearance of fishes, &c., and indeed the disintegrated and powdered scales of the *Placunæ* (moon-shells, Chinese-window oysters, as they are called by collectors) are so used by the Chinese in their water-colour drawings.

Pearls.—Mr. Hatchett made the same experiments on pearls as those to which he submitted shells, and the former proved to be similar in composition to the mother-of-pearl. He presented to the Museum of the Royal College of Surgeons in London numerous small pearls which had been immersed in acetous acids and thus reduced to their membranaceous constituent. (*Preparation*, No. 98 D.) So far as their size would enable Mr. Hatchett to discern, they appeared to be formed by concentric coats of membrane and carbonate of lime: by this structure, he adds, they much resemble the globular calcareous concretions, found at Carlsbad and other places, called Pisolithes. When pearls were swallowed by the antients in the absurd profligacy of their luxury, they appear to have been treated like those in the preparation last above noticed.

The term shell is also commonly applied to the covering of crustaceous animals and the crusts of *Echini:* thus people familiarly talk of the shell of a lobster or crab and of the shell of a sea-egg. Mr. Hatchett remarks that there is reason to conclude that phosphate of lime mingled with the carbonate is a chemical characteristic which distinguishes the crustaceous from the testaceous substance; and that the principal difference of the qualities of each, when complete, is caused by the proportion of the hardening substances, relative to the gluten by which they are cemented; or by the abundance and consistency of gelatinous, membranaceous, or cartilaginous substance, in and on which the carbonate of lime, or the mixture of carbonate and phosphate of lime, has been secreted and deposited. Thus the presence of phosphate of lime mingled with carbonate appears to be a chemical character of *Crustaceans* and *Echini*. No. 110, in the College Museum, is the outer crust of an Echinus (*Siderites Hystrix*, Lam.) from which the earthy constituent has been partially removed by the action of acid; and No. 111 is a section of the crustaceous covering of the claw of a lobster which has been similarly treated, and has become soft and elastic and of a yellowish-white colour, but still retains its original figure. (*Cat.*, vol. i.) [Avicula; Pearl Fishery; Pearls.]

For an account of the power of excavating and perforating stone, shell, and wood possessed by the testaceous Mollusca, see the articles Clavagella, Gastrochæna, Lithophagidæ, Pholas, and Teredo; for their value as records by which the stratification of the earth's crust may be demonstrated, and its geological history deciphered, see the articles Malacology, Geology, and Organic Remains.

SHELL, PEARL. [Shell.]

SHELL, a hollow globe of iron, containing gunpowder, which is introduced at an orifice formed in the ball. In this orifice is driven or screwed the fuze or tube containing the composition by which the powder in the shell is ignited [Fuze]; and the shell, after being discharged from a gun, howitzer, or mortar, is consequently made to burst in pieces when it falls upon or near the object to be destroyed. The diameters of shells for guns vary from $3\frac{3}{5}$ inches to 10 inches, and the weight of a 10-inch shell is 70 lbs. The diameters of shells for mortars and howitzers vary from $4\frac{1}{2}$ to 13 inches, and the weight of a 13-inch shell is 200 lbs. The diameters for carronades vary from $3\frac{3}{5}$ inches to 8 inches. [Bomb; Case-shot.]

SHELLEY, PERCY BYSSHE, was the eldest son of Sir Timothy Shelley, Bart., of Castle Goring in Sussex. The Shelley family is of old standing,* branching out into three several baronetcies, one of which has become the representative of the kindred of Sir Philip Sidney, a connection Shelley was justly proud of, though he set little value on family distinctions. Percy Bysshe was born at Field Place, Sussex, on the 4th August, 1792, where he was brought up with his sisters till the age of eight years, receiving the same education, and always exhibiting disinclination for boyish sports. He was shy, bashful, and reserved. He was then sent to school at Sion House, Brentford, where his delicate constitution and girlish disposition drew on him all the petty tyrannies and horrors of school. He depicts them with tearful eloquence in the introductory stanzas to his 'Revolt of Islam.' At the age of thirteen he was removed to Eton, where his spirit, which through life revolted at oppression, rose up against the system of *fagging*. He gained no distinction at Eton, though he proved himself even there a tolerably good scholar by translating several books of Pliny's 'Natural History;' but he stopped at the chapters on astronomy, which his tutor owned his inability to explain. His novels of 'Zastrozzi' and the 'Rosicrucian' are said to be extraordinary productions for the age at which they were written (fifteen). They have been reprinted in the 'Romancist' collection.

In 1808 he went to Oxford; and here we cannot but refer to the exquisite series of papers called 'Shelley at Oxford,' which appeared in the 'New Monthly Magazine' during 1832, written by his friend and schoolfellow, for those anecdotes which exemplify his character. During his last term at Oxford he published a pamphlet with the startling title of 'The Necessity of Atheism,' wherein he put forth certain propositions to which he demanded answers from the heads of the Colleges. The answer was, as might be expected, expulsion. We have never seen this very rare pamphlet, but the title alone betrays youthful presumption and recklessness. His expulsion was the cause of great dissension with his family, and in consequence he came up to London, where he amused himself with addressing letters to all whose works pleased him; among others, to Mrs. Hemans, who had just arisen on the poetical horizon. It was about this time that 'Queen Mab' was completed. He never published it; he felt that he was too young to decide on such matters whereon 'all doctors disagree,' and he was desirous of acquiring 'that sobriety of spirit which is the characteristic of true heroism.' He had therefore only a few copies struck off for private circulation, and was much annoyed when a piratical bookseller published it. He endeavoured to stop its publication, but failing, he disavowed any participation in it, through the columns of the 'Examiner.' Of this 'Queen Mab' his latest reviewer says, 'Like most poems produced at this age, it is remarkable for a strange mixture of poetic beauty and crude deformity—of clear insight and heated extravagance, of deep views and chimerical absurdities. We may compare it to 'Die Raüber' of Schiller, or 'Werthers Leiden' of Göthe, as possessing the same strong feeling of the rottenness of existing things, the same passionate sympathy with more idealised views, and the same distorted views of the causes of evils. It is the production of a boy, but the boyhood is that of a giant. One of the cardinal points in the philosophy of 'Queen Mab' is that all the evils tearing the great heart of the world up by its bloody roots, and turning earth, which should be the 'the reality of heaven,' into a 'dark continuance of the hell within us,' are owing to priests and kings. This was the current doctrine of the time. He was writing fiercely against his own chimeras; this was his mistake. He did not write anything really applicable to these offices, but at the same time he used their names and offended all the sacred feelings which 'hedge the king,' without having 'a show of reason on his side;' it appeared therefore as mere blasphemy or wantonness, though it was far different.' (*Westminster Rev.*, lxix.) When Shelley, thus thrown upon the world, had rejected current ethics, he was anxious to find a system more consonant to his views. This he found in Godwin's 'Political Justice,' a book which made a great impression in its day, and from which Shelley drew the resolution 'to square all his actions by what he conceived to be the strictest justice, without any consideration for the opinions of others.' 'That he did some extraordinary things in consequence, is admitted; that he did many noble ones, and with all sincerity, is well-known to his friends, and will be admitted by all sincere persons.' It was this justice which made him reject an estate because he 'would not become a yea and nay man.' Drawing himself, he afterwards wrote,—

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* The site of the present Bull Inn, Aldersgate Street, was formerly that of one of the Shelley mansions.

> 'Men wonder'd, and some sneer'd to see
> One sow what he could never reap;
> For he is rich, they said, and young,
> And might drink from the depths of luxury.
> If he seeks fame, fame never crowned
> The champion of a trampled creed.'
>
> *Rosalind and Helen.*

And yet he remained this champion. He shortly after completed the exasperation of his father, who entirely abandoned him, by his marriage with Harriet Westbrooke, the daughter of a retired coffee-house keeper. Various versions are given of the story: some say he was inveigled into the match; others, that she watched him during illness, and that he then fell in love with her. She was very beautiful, but giddy, coquettish, and weak-minded. The result of this union could not be other than unhappiness. For three years they dragged on a wearing and fretful existence, during which she bore him one child to sweeten their lot. But at length the want of sympathy, the misunderstandings, and some other more serious matter which intervened, occasioned a separation. She took the child, and he allowed her a sufficient income, which was paid quarterly; he confided her to the care of her relations, and in 1814 went abroad to recruit his health.

An account of this trip has been given in a charming little volume called a 'Six Weeks' Tour through a part of France, Switzerland, Germany, and Holland,' and reprinted in vol. ii. of Shelley's 'Letters and Essays.' Accompanied by two friends he performed the greater part of it on foot, and thus three of them travelled over a space of eight hundred miles at an expense of thirty pounds. The next eighteen months he passed in London, where he renewed his acquaintance with Leigh Hunt, who was then imprisoned for libel, and made him the princely offer of a hundred pounds as an expression of his sympathy, which sum however Leigh Hunt fortunately did not need. In May, 1816, Shelley again visited the Continent, and reached Sécheron, near Geneva, on the 17th of that month, where he learned that Lord Byron was stopping at the same hotel. Some correspondence on 'Queen Mab' had already passed between them, and they were so delighted with each other at the first interview, that Shelley took a villa immediately at the foot of the one occupied by Byron, in the Campagne Diodati. Early in July they went on a tour to Mellerie, Clarens, Schillon, Vevai, Lausanne, Chamouni, Montauvert, Mont Blanc, &c. (described with great beauty in his 'Letters and Essays,' vol. ii., pp. 61, et seq.). The summer of 1817 he spent on the Lake of Como.

In November, 1817, when Shelley was at Bath, the appalling news reached him of his wife's suicide. 'He hurried to London, to his friend Leigh Hunt, where he endeavoured to gain consolation, and got all that tenderness and sympathy could bestow. It tore his being to pieces, and for some time his reason was despaired of. Many were the stories that ran through the papers of the day pretending to be a true account of the matter, and the writer of this notice has not unfrequently been asked if 'Mr. Shelley didn't murder his wife.' We need scarcely add that these were the inventions of his enemies; that Shelley had been absent from his wife, and had been so for some time; that he had confided her to the care of her relations, and that all intercourse between them had ceased; and yet he bitterly reproached himself with not having watched over one so young and so weak. In truth Shelley was not without blame in the matter, though very different from what is usually attached to him.

Shortly after this event Shelley was deprived of the care and education of his children by an order of the lord chancellor. The case attracted considerable attention at the time, as being an instance of the interference of the Court of Chancery with the parental authority. The facts, as they appeared in the proceedings before the Court, are as follow. After the death of Shelley's wife a petition was presented, in the name of the children, in the Court of Chancery, which stated that Shelley and his wife were married in 1811; that about three years before the time of presenting the petition, Shelley had deserted his wife* and had since unlawfully cohabited with another woman; that therefore the mother returned to her father's house with the eldest of the infants, and the other was soon after born; and that since that time the infants had been maintained by their mother and her father, and that their mother had lately died. It was then stated among other things that the father avowed himself an atheist, and that since the death of his wife he had demanded that the children should be delivered up to him, and that he intended, if he could, to get possession of their persons and educate them as he thought proper. The grounds on which the lord chancellor (Eldon) restrained Shelley from taking possession of his infant children, and directing their education, were stated by himself in a written judgment, as follows:—'I consider that this is a case in which the father has demonstrated that he must and does deem it to be matter of duty which his principles impose on him, to recommend to those whose opinions and habits he may take upon himself to form, that conduct in some of the most important relations of life, as moral and virtuous, which the law calls upon me to consider as immoral and vicious—conduct which the law animadverts upon as inconsistent with the duties of persons in such relations of life, and which it considers as injuriously affecting both the interests of such persons and those of the community.' (Shelley *v.* Westbrooke, in Jacob's *Reports*, p. 266.)

After the death of his unfortunate wife he married Mary Wolstonecraft Godwin (the present Mrs. Shelley, author of 'Valperga,' 'Frankenstein,' &c., daughter of Mary Wolstonecraft and Godwin. They retired to Great Marlow in Buckinghamshire, where he was a blessing to the poor. 'His liberality was unbounded; he attended to the wants of the poor, not by liberal endowment of pence in the street, or by "subscriptions," but by actual inspection into their wants, relieving them with kind words and suggestions as well as money; regardless of infection—which once unhappily occurred in the form of a severe ophthalmia caught in these cottages; and moreover he studied medicine and walked the London hospitals in order that he might attend the sick in his neighbourhood!' (*Westminster Review*, lxix., p. 310.) It was here he wrote 'Alastor' and 'The Revolt of Islam.' Poems so well known to every lover of poetry as these require no comment. They are pregnant with his peculiar views and hopes for humanity, and they contain some of the most splendid writing in the language. The reviewer before quoted has examined them at length.

Early in the spring of 1818 Shelley and his family left England for Italy. The breach between himself and relatives had become irreparable: his name was coupled with every odium which the press and private malice could heap upon it. The publicity given to his extraordinary opinions, in consequence of the application to the Court of Chancery, had rendered him so unpopular, that it was impossible to remain in England, and his health was gradually declining. When at Pisa he went one day to the post-office to inquire for letters; an Englishman, on hearing his name, said, 'What, are you that d——d atheist Shelley!' and struck him with a stick so brutally that he fell stunned to the ground. On recovering Shelley found that the man had fled, and he never discovered him. In Italy he renewed his acquaintance with Lord Byron; and the testimony of the noble lord, 'who libelled his friends all round,' may not be uninteresting: 'You are all mistaken about Shelley,' he writes to Moore; 'you do not know how mild, how tolerant, how good he was in society; and as perfect a gentleman as ever stepped across a drawing-room.' And again: 'He is to my knowledge the least selfish and mildest of men; a man who has made more sacrifices of his feelings and fortunes to others than any man I ever heard of.' (Moore's *Life of Byron*, 4to., ii. 580.) It was while at Pisa, when the affray took place which will be remembered by all readers of Byron's 'Life,' that Shelley rushed in between the uplifted sword of the infuriated dragoon and his friend Byron, and received the blow himself which knocked him off his horse (*Rapporto sopra l'Accaduto al Nobile Lord Byron*); and which made Byron wonder how and 'upon what principle a man could be induced to prefer any other person's life in that manner before his own!'

During his residence in Italy, besides enriching his mind with the master-works of art, he began the study of Calderon, some fragments of whose 'Magico Prodigioso' he translated with rare felicity. He there produced in rapid succession his 'Prometheus Unbound;' 'Cenci;'

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* The real facts of the case were that Shelley and his wife separated by mutual consent. She cohabited with another man; he with another woman.

'Hellas;' 'Julian and Maddalo;' 'Epipsychidion;' 'Ode to Naples,' &c. That marvellous but mysterious fragment 'Epipsychidion' was addressed to La Contessina Emilia Vilani, a lovely and accomplished girl who was immured in the convent of St. Anne by her parents. In her fate Shelley took a prodigious interest, and used every exertion to procure her release. They exchanged locks of hair and other little tokens of sympathy. The mention of this circumstance throws a new light on the poem, but it still remains in many parts impenetrable. The commencement,

> 'Sweet spirit! sister of that orphan one
> Whose empire is the name thou weepest on!'

is utterly unintelligible as it stands, and yet there can be no doubt that to him it was clear enough: he knew the allusion; we do not. The 'Prometheus Unbound' is perhaps the finest lyric drama in the language. It is full of the spirit of beauty; and the inexhaustible play of fancy and imagination flashing through every part of it dazzles the mind so that we see but indistinctly. It is the most *ethereal* poem in the language; but it is also open to the charge of mysticism, and we agree with the critic that it is 'of no use his being in the clouds, if he draw up his Jacob's ladder after him, and only leaves us gazing, conscious that he is there, but ignorant of what else may be there. His voice may be a pillar of fire ascending to unknown regions, but it is shrouded by a pillar of smoke, which nullifies both heat and light.' The 'Cenci' is, after Shakspere, the grandest and most perfect drama of modern times; and it differs from all Shelley's other writings in its simplicity, distinctness, and unity, both of conception and execution. The subject is too awful and too horrible for our stage; and indeed it would require actors of a higher stamp than any we possess to render the personation endurable; but in the closet it remains a glorious monument to the author's genius.

In July, 1822, while crossing the Gulf of Lerici with his friend Edward Ellcker Williams in a little pleasure-boat, they were overtaken by one of those tremendous squalls common to the Mediterranean, and were drowned. Shelley's remains were burnt by Lord Byron, Leigh Hunt, Trelawney, and one or two other friends, and then conveyed to Rome, where they were interred close to those of his friend and brother poet Keats, with this inscription, written by Trelawney:—

PERCY BYSSHE SHELLEY
COR CORDIUM.
NATUS IV. AUG. MDCCXCII.
OBIIT VIII. JUL. MDCCCXXII.

> 'Nothing of him that doth fade
> But doth suffer a sea change
> Into something rich and strange.'
>
> *Tempest.*[*]

Thus, in his twenty-ninth year, when just attaining maturity as a man, clearness and calmness as a philosopher, and artistic ordination of materials as a poet, died Percy Bysshe Shelley. His whole life was a tragedy, and a devotion of himself to the cause of humanity. In his youth, his recklessness of offending the opinions of others—the vehemence of his religious and political persuasions, which amounted to fanaticism—and the crude daringness of those opinions, made many enemies, but no one ever knew him personally without loving him devotedly. His errors were few, and sprang from the same soil as his virtues—enthusiasm and inflexible sincerity. He was the most truthful man we have ever heard of, and in philanthropy a perfect Howard. He has been known repeatedly to give away all his money to the distressed before he reached the coach-office, and so been obliged to walk up to town. He gave Leigh Hunt 1400*l.* to get him out of his difficulties. He allowed a poor man of letters an income of 300*l.* a year, his own being no more than 1000*l.* In a word, to cite instances of his generosity would lead us beyond all limits. In person he was 'tall and slight, and his constitution consumptive. He was subject to violent spasmodic pains, which would sometimes force him to lie on the ground till they were over; but he had always a kind word to give to those about him, when his pangs allowed him to speak. Though well turned, his shoulders were bent a little, owing to premature thought and trouble. The same causes had touched his hair with grey; and though habits of temperance and exercise gave him a remarkable degree of strength, it is not supposed that he could have lived many years. Like the Stagyrite, his voice was high and weak. His eyes were large and animated, with a dash of wildness in them; his face small but well shaped, particularly the mouth and chin, the turn of which was very sensitive and graceful. His complexion fair and delicate, with a colour in the cheek. He had brown hair, which, though tinged with grey, surmounted his face well, being considerable in quantity and tending to curl. When fronting and looking at you attentively, his aspect had a certain seraphical character that would have suited a portrait of John the Baptist, or the angel whom Milton describes as holding a "reed tipt with fire."' (Leigh Hunt's 'Lord Byron,' p. 174.)

Shelley's translations from the Greek are exquisite, and drew loud praises from the 'Quarterly.' *They* may be considered as the best in our language. His version of 'Faust,' a fragment of which is published, though admirable in spirit and effect, is not faultless with regard to meaning. He had not quite mastered the language.

His reputation as a poet has gradually widened since his death, and has not yet reached its culminating point. He was the poet of the future—of an ideal futurity wherein earth became the reality of heaven—and hence it was that his own age could not entirely sympathise with him. He has been called the 'Poet of Poets'—a proud title, and in some respects deserved.

SHENDY. [NUBIA.]

SHENSTONE, WILLIAM, an English poet, was born November, 1714, at the Leasowes, Hales Owen, Shropshire. He was sent to Pembroke College, Oxford, in the year 1732, and remained there some time, taking no degree. He amused himself in a desultory manner, travelling about and writing poetry, till 1745, when he commenced residing on his patrimony at his native place. The remainder of his life was spent in rural occupations. He took great pride and spared no expense in the cultivation of his garden, and in his latter years became much involved in consequence. He died Feb. 11, 1763. A very beautiful Latin epitaph on his cousin, and a stanza, quoted by Johnson in his Life of him, full of genuine and simple feeling, redeem his poems from the charge of utter insipidity and lifelessness. They consist of elegies, pastorals, and odes, &c. A spirit of mortified ambition, ill suited to the retirement which he professed to court, appears in all his writings. (Johnson's *Lives of the Poets.*)

SHEPHERD. [SHEEP.]

SHEPHERD'S NEEDLE. [SCANDIX.]

SHEPPEY, ISLE. [KENT.]

SHEPTON MALLET. [SOMERSETSHIRE.]

SHERARD, WILLIAM, better known as the patron and fellow-labourer of other botanists than by his own writings, was born at Bushby in Leicestershire, in the year 1659. He received his early education at Merchant Taylors' School, and was entered as a student of St. John's College, Oxford, in 1677, and became a fellow of the same college in 1683. He was travelling tutor successively to Charles, second viscount Townshend, and to Wriothesley, lord Holland, son of Lord Russell who was executed. During this period of his life he made two tours on the Continent, in Holland, France, Italy, &c.; and then made the acquaintance of Boerhaave, Hermann, Tournefort, Vaillant, Micheli, and of most others of the ablest botanists of the time. He is believed to have been the author of an anonymous work called 'Schola Botanica,' published at Amsterdam, in 1689, giving an account of the plants then growing in the botanic garden at Paris. In 1700 he communicated a paper to the Royal Society, on the making of Japan and Chinese varnishes, which was inserted in the 22nd volume of their 'Transactions.'

In 1702 he was appointed British consul at Smyrna, having previously been one of the commissioners for the sick and wounded at Portsmouth. Smyrna afforded him an opportunity of pursuing botany; here he laid the foundation of his great 'Herbarium,' which is still a national treasure, and cultivated with great care and attention many rare and exotic species of plants. In 1718 he returned to England, and received the degree of LL.D.

In 1721 he returned to the Continent, and Vaillant, the African traveller, being then in a dying state, Sherard succeeded in transferring the manuscripts and drawings of the great traveller to Boerhaave, who published them in the 'Botanicon Parisiense,' in 1727. In this work Boerhaave was materially assisted by Sherard. In his various visits to the Continent Sherard became intimate with Dillenius, who was professor of botany at Giessen; and in 1721 he invited him to come over to England to superintend the botanic garden of his brother Dr. James Sherard, at Eltham. This invitation was accepted by Dillenius, and forms an important point in the history of botany in this country

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[*] This inscription we find *literatim* in the Life of Shelley, prefixed to the German translation of his 'Cenci,' by Felix Adolphi (Stuttgart, 1837), who himself copied it at Rome.

Sherard was a quiet unassuming man, who loved the study of natural history for its own sake. He seemed to prefer assisting others in their labours to producing anything of his own. He was thus the fellow-labourer of Catesby, in the 'Natural History of Carolina,' and also of Dillenius, in the publication of the 'Hortus Elthamensis.' He died in 1728, at the age of sixty-nine. At his death he bequeathed his great Herbarium, containing upwards of 12,000 species of plants, to the University of Oxford, and also left 3000*l.* for the purpose of endowing a botanical chair in the same university. This was undoubtedly the greatest service done by Sherard to botany; and although at present it may have produced little fruit, yet the perpetuity of the gift would lead us to anticipate in the future important results. When natural history is placed upon an equal footing with other departments of study in our universities, we may expect to derive benefit from the labours of professors who occupy its chairs.

Dillenius was the first who occupied the chair of botany founded by Sherard. He was born at Darmstadt in 1687. He came over to England in 1721. He published in this country a new edition of Ray's 'Synopsis,' illustrated with twenty-four plates, in 1724. The 'Hortus Elthamensis' appeared in 1732. His greatest work, and one which has had a most important influence on the study of botany, is the 'Historia Muscorum,' published in 1741. Although the name would indicate that the mosses were the only subjects treated on, it included observations on all the families of cryptogamic plants. It contains a fund of original research, and many modern observers would do well to consult this volume before announcing their observations as entirely new. Sherard during his life wished to have completed or continued Bauhin's 'Pinax,' a work intended to have been a description of all the plants then known, and for this purpose he collected a great mass of materials. It was his wish at his death that this should be done by the new professor at Oxford, but either Dillenius did not feel competent to the task, or was too much occupied with his 'Historia,' for the continuation of the 'Pinax' never appeared. Dillenius died in 1747. His Herbarium is now with that of Sherard at Oxford, which, containing as it does specimens from Linnæus, Tournefort, and other eminent botanists of that day, is, next to the Herbarium of Linnæus himself, one of the most authentic and valuable botanical records that exists.

SHERBET, a word adopted from the Persian. The French name is *sorbet*, which, as well as the Italian *sorbetto*, and the Spanish *sorbete*, are probably derived from the Latin *sorbere*, 'to sup.' Sherbet, in Persia, Turkey, and other eastern countries where it is chiefly used, is a beverage composed chiefly of water, lemon-juice, and sugar, with the addition of other ingredients to render it more pleasant to the taste, as the pulp of fruits, perfumed cakes, amber, rose-water, &c.

SHERBORNE, or SHERBOURNE, a market-town in the hundred of Sherborne and county of Dorset, on the Exeter mail-road, 121 miles from London by railway to Basingstoke, and from thence by Salisbury and Shaftesbury: in 50° 57′ N. lat. and 2° 31′ W. long.

This place was of considerable importance in the time of the Saxons, who called it 'Sciraburn,' or 'Scireburn,' from *scir*, clear, and *burn*, a spring or brook. William of Malmesbury and Brompton write the name Schireburn, Schirebourne; and Henry of Huntingdon, Syreburn, or Seyreburn. Ina, king of the West Saxons, on the division of the diocese of Winchester, then the sole bishopric of the West Saxons, made Sherborne the seat of an episcopal see (A.D. 705). The first bishop was Aldhelm, a man of great repute for his learning; and among his successors were Alstan (Althstan or Ealstan), distinguished as a politician and a warrior in the reigns of Egbert and Ethelwulf; and Asser, the friend and biographer of King Alfred. The diocese originally comprehended the counties of Dorset, Berks, Wilts, Somerset, Devon, and Cornwall; but was diminished by the erection of new bishoprics, the dioceses of which were subtracted from it. The changes which this bishopric underwent have, from the obscurity of the period, been the subject of much discussion. The seat of it was removed, about A.D. 1975 or 1076, to Old Sarum. [Sarum.] A monastery for secular canons was established here after the conversion of the West Saxons. The rule of St. Benedict was afterwards introduced (A.D. 998), and it became an abbey, which continued to the dissolution, when its revenue was valued at 682*l.* 14*s.* 7¾*d.*

There was an antient castle at Sherborne, which was built by Roger, bishop of Sarum, in the reign of Henry I., and changed hands once or twice in the civil war of Stephen and the empress Maud. At that time, and for some time after, the town appears to have gone very much to decay, but afterwards revived. In the reign of Edward III. it sent representatives to parliament, and at a later period the assizes were often held here. In the time of Leland and Camden, it was, with the exception perhaps of Poole, the most frequented town in the county, and the seat of a considerable woollen manufacture. After the Reformation the clothing-trade declined, and was replaced by the manufacture of buttons,. bone lace, and haberdashery, which was succeeded, towards the middle of the last century, by the silk manufacture. In the great civil war the castle was held for the king by the marquis of Hertford; but on his retiring it was taken by the parliamentarians under the earl of Bedford (A.D. 1642). In the following year the parliamentarians again entered the town, after a smart action with the townsmen (who drove out the party which first entered), and took the castle, which the royalists had again occupied. In 1645 the royalists held it again, until it was stormed by Cromwell and Fairfax with their forces, notwithstanding the gallant defence of Sir Lewis Dives, the governor. After this the castle was demolished.

The town is pleasantly situated, partly on the slope of a hill, partly in the pleasant vale of Blackmore. It is irregularly laid out; part of it is well paved and lighted, and well supplied with water. The church is a large cross-church, with various portions of different dates. The south porch is a curious specimen of Norman. The largest part of the church is good perpendicular, and was partly erected in the reign of King Henry VI. The choir and its aisles have good buttresses, pinnacles, and flying buttresses, and a very good pannelled parapet. The belfry story of the central tower, rising above the roof, has eight windows with buttresses, which rise from a bold slope under the windows, below which the tower is plain. This church antiently belonged to the abbey; and some portions of the additional buildings remain, though very much mutilated, and converted to various purposes. Three sides of the lower part of the tower appear to be the original fabric, but the eastern side is of the same date with the choir. There are a few good early English windows in the north aisle of the choir or its chapel. The groining of most of the church is rich and good; the south transept has a wood ceiling. There are some remains of antient stalls and screen-work, and some portions of antient stained glass. The tower is said to be upwards of 150 feet high. Attached to the church are four antient chapels, one on each side of the south transept, and two on the east side of the north transept. The remains of two others form part of the house occupied by the head-master of the grammar-school.

At the east end of the church is the grammar-school. The head-master's apartments, which are part of the school premises, include several remains of the abbey buildings: the school-room was built in the time of Charles II., on the site of an antient chapel. On the south side of the church-yard is an almshouse with a small chapel. It is an antient building of perpendicular date, originally an hospital of the order of St. Augustin: the dormitories retain the same form as when erected in the fifteenth century. The remains of the monastic buildings on the north side of the church comprehend the refectory, which was some years since used as a silk manufactory, some part of the abbot's lodgings, the abbey gateway and barn, and the abbey-mill. A conduit belonging to the abbey has been removed into the market-place of the town; it is in a very mutilated condition. The building now called the abbey-house was erected out of the ruins of the abbey soon after the dissolution.

The remains of the castle are on a rocky eminence at the east end of the town; the whole area comprehends four acres, and is surrounded by a deep ditch, on the inner bank of which the foundations and fragments of the walls (six or seven feet thick) enclosing the greater ballium or court may be traced. The gate-tower and some parts of the buildings in the centre of the ballium remain, but the latter are in too ruinous a condition for the plan to be exactly traced. In the fine pleasure-grounds which surround the ruins of the castle is Sherborne Lodge, frequently called Sherborne Castle, the residence of the Earl of Digby; it was built by Sir Walter Raleigh, and contains some interesting portraits. There are some antient houses in the town of Sherborne, especially a large one built round a square court, and called the New Inn. The town-hall and market-house are near the church. There are meeting-houses for Independents, Wesleyans, and Quakers.

The parish comprehends an area of 4900 acres, and had in 1831, 762 houses, inhabited by 985 families; the population was 4075, about one-fifth agricultural. Various branches of the silk manufacture, especially the making of silk twist and buttons, are carried on. There are two weekly markets, on Thursday and Saturday, the latter the most important, and three yearly fairs. It is one of the polling-stations for the county.

The benefice is a vicarage in the peculiar jurisdiction of the dean of Sarum, of the clear yearly value of 258*l*., with a glebe-house, a building of considerable antiquity.

There were in the parish, in 1833, the grammar-school, with 102 boys (32 on the foundation); the Blue-Coat school, with a small endowment, with 32 boys and 2 girls; a third endowed school with 23 girls; a national school with 137 boys; and ten other day-schools, with 60 boys and 169 girls; an evening Lancasterian school, supported by subscription, with 50 boys and 90 girls; and two Sunday-schools, with 35 boys and 171 girls.

SHERBURNE, SIR EDWARD, descended from an antient family residing at Stainhurst in Lancashire, was born in London, on the 18th of September, 1618. Wood mentions his grandfather as a member of Corpus Christi College at Oxford. In his younger days he had the advantage of the instructions of the celebrated Thomas Farnaby, who then taught a school in Goldsmith's Rents; but in 1636, Farnaby removed from London, and transferred his pupil to the care of Charles Aleyn, who had been one of his ushers, and who is known as the author of some very inferior historical poetry. In 1640 Sherburne set out on the grand continental tour, from which he was suddenly recalled to solace the few remaining days of his father, who died in 1641, leaving his son in possession of the post which he had enjoyed of the clerkship of his majesty's ordnance. The rebellion however prevented his retaining this situation for any length of time. Being indeed a Roman catholic and firm royalist, he was ejected by a warrant of the House of Lords in 1642,* and harassed by a long and expensive confinement in the custody of the usher of the black rod. After his release he entered actively into the service of the king, who created him commissary-general of the royal artillery. Various fortunes now awaited him. He witnessed the memorable battle of Edge-hill; he attended the king at Oxford, where he took his master's degree on Dec. 20th, 1642, and pursued his studies for some time; he went to London in 1646, where he was plundered of all his property, and finally compelled to hide himself for safety in the chambers of a relation in the Middle Temple. About 1651 fortune once more smiled upon him, and he was appointed by Sir George Savile, who had then recently returned from abroad, superintendant of his affairs, and shortly afterwards was made travelling tutor to Sir John Coventry, with whom he visited different parts of the Continent between the years 1654 and 1659. On the Restoration he obtained with considerable trouble his old situation in the Ordnance, which was again sacrificed at the Revolution of 1688, through his unflinching adherence to principle in refusing to take the necessary oaths. His unvarying good conduct however had previously procured him the honour of knighthood from his majesty, on Jan. 6th, 1682. There is every reason however to believe that his latter days were embittered by the evils of poverty, caused principally by his inability to change his opinions with the times, as we find him in 1696 presenting a supplicatory memorial to the earl of Romney, then master-general of the ordnance, and another to the king. Whether either of these applications was attended with success is not known. He continued his retirement till his death, which took place at London, on Nov. 4th, 1702.

Sherburne was the author of poetical translations of two pieces from Seneca, the 'Medea,' and the 'Troades,' published respectively in 1648 and 1679. These works procured him considerable reputation in his time; but his fame at present principally rests on the translation of 'Manilius,' published at London in 1675, in a handsome folio volume, and enriched by a valuable appendix containing lives of scientific men. This appendix is particularly valuable to the scientific historian as containing much information regarding Sherburne's contemporaries not to be met with elsewhere.

SHERIDAN, DR. THOMAS, translated the 'Satires of Persius' into prose, and also the 'Philoctetes' of Sophocles into verse; but neither of these translations is worthy of being rescued from the neglect into which they have fallen. His talents were more of a social nature,—punning, quibbling, and fiddling, according to Lord Cork, with an incessant flow of animal spirits.

Dr. Sheridan was born in the year 1684 (Cibber's 'Lives of the Poets'), in the county of Cavan. His parents were poor; but he was placed by a friend at Trinity College, Dublin, where he made considerable progress in classical literature. He afterwards took orders, and then set up a school in Dublin. Swift, who was his friend, procured him, in 1725, a living in the south of Ireland of about 150*l*. a-year; but his recklessness or impudence, one knows not which, spoiled all his expectations; for he preached a sermon on the 1st of August (the anniversary of King George's birth-day), on the text 'Sufficient for the day is the evil thereof.' On this being known he was struck off the list of chaplains to the lord-lieutenant, and forbidden the castle.

Our punning fiddling parson however bore this with a light heart, and soon after changed his living for one in Dunboyne; but owing to the cheating of the farmers and other causes, the income was lowered to 80*l*. a-year. As this did not suit him, he speedily gave it up for the free school of Cavan, where he had a salary of 80*l*. a-year besides his scholars. He was through life indolent, careless, slovenly, and indigent. His animal spirits seemed to supply every other deficiency, and to have preserved him cheerful amidst all his poverty and distress; but his habits as well as his temperament were careless and ill-regulated, and prevented any strict attention to his duties. His indolence or imprudence made him sell his situation for 400*l*., alleging as an excuse the 'moist and unwholesome air of Cavan;' but we find him afterwards making no attempt to establish himself elsewhere. This 400*l*. was soon spent, and the 'ill-starred, good-natured, improvident man,' as Lord Cork calls him, fell into sickness and distress, which was terminated by a speedy death in 1738.

Lord Cork, speaking of him, says 'Not a day passed without a rebus, an anagram, or a madrigal. His pen and fiddlestick were in continual motion.'

(*Biographia Dramatica; Life of Swift*, by Sheridan (the son); and *Swift's Works;* Cibber's *Lives of the Poets;* Chalmers' *Biog. Dict.*)

SHERIDAN, THOMAS, M.A., the author of the 'Dictionary of the English Language,' was the son of the above, and born at Quilca, the residence of Swift, in 1721. Swift was his godfather, and treated him with uniform kindness. His education was commenced by his father, who subsequently sent him to Westminster School, where he was a king's scholar. He afterwards entered Trinity College, Dublin, where he took his degree of master of arts. When his father died he was without a profession, and destitute of all expectations; but having conceived that exalted and extravagant idea of oratory which haunted him through life, he determined on its restoration. To this end he devoted himself to the stage as the first qualification for understanding the art of oratory. He appeared as Richard III. in January, 1743, and 'met with the greatest encouragement.'

In 1744, he accepted an engagement at Covent Garden Theatre; and in 1745 he played with Garrick at Drury Lane, where some of his friends, more kind than judicious, endeavoured to set him up as a rival of Garrick. The consequence was a quarrel between the two, which lasted for life. Sheridan then returned to Dublin, and became manager of the theatre there, and he effected a very praiseworthy reform in the 'goings on' behind the scenes. The young college students and others had long been in the habit of attending rehearsals, frequenting the green-room, and carrying on gallantries with the actresses, much to the annoyance of all, and to the impediment of business. After a strong struggle Sheridan reformed this abuse. For eight years he continued his management with success, till in 1754 he was driven from from it by one of the popular tumults so common in those days. In this year, when 'the rancour of political party arose to the greatest height that it had almost ever been known to do in Dublin, Mr. Sheridan unfortunately revived Miller's 'Mahomet.' In this play were many passages respecting liberty, bribery, and corruption, which pleased the anti-courtiers as expressive of their opinions in regard to certain persons at that time in power, and therefore they insisted on those passages being repeated, which the actor complied with. The absurdity however of such repetitions, merely as destroying the effect of the tragedy, having occurred to the manager, the same speeches, when again called for by the audience on the succeeding night, were refused by the actor; and he being obliged to hint the cause of his refusal, the manager became the object of their resentment. On his not appearing to mollify their rage by some kind of apology, they cut the scenery to pieces with their swords, tore up the benches and boxes, and, in a word, totally despoiled the theatre; concluding with a resolution never more to permit Mr. Sheridan to appear on that stage.' (Chalmers's *Biog. Dict.*)

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* Aubrey, in the Ashmolean MS., says May 1642, while other biographers assert that this event happened in the preceding month.

He afterwards (1756) returned to Dublin and his management—the agitation having subsided; but though he was received with great favour by the audience, yet Barry and Woodward having erected another theatre, and decoyed some of his principal performers, as well as a London company, this with other causes quite ruined him, and he was obliged to give up all concern in the theatre.

It was then that he again relied on his indestructible faith in oratory, and the immense advantages to accrue from it. He published a plan, in which he proposed to his countrymen the establishment of an academy for the accomplishment of 'youth in every qualification necessary for a gentleman.' In the formation of this design, he considered the art of oratory to be one of the essentials; and to give a stronger idea of the utility of that art, he opened his plan to the public in three orations, which were also to be the proofs of his fitness for the office of superintendant of the academy, for which post he offered himself. The proposal was in some degree carried into execution; but for some reason Sheridan was excluded from any share in conducting it.

Sheridan however was not a man to be daunted, especially on the question of oratory, so accordingly we find him in 1759 lecturing in England on that subject. He had published an 8vo. volume entitled 'British Education: the source of the disorders in Great Britain. Being an essay towards proving that the immorality, ignorance, and false taste which so generally prevail, are the natural and necessary consequences of the present defective system of education; with an attempt to show that a revival of the art of speaking and the study of our own language, might contribute in a great measure to the cure of those evils.' The title is highly amusing; but it seems to have imposed on the public, for the lectures which he composed in confirmation of it, and delivered in London, Oxford, and Cambridge, met with immense success: at the last place indeed he was honoured with the degree of Master of Arts. In 1760 he again appeared at Drury Lane, but disagreements with Garrick soon put a stop to his engagement.

On the accession of George III. a pension was granted him, which so enraged Doctor Johnson, that he exclaimed, 'What, give him a pension!—then I must give up mine.' This was of course repeated to Sheridan, and he never forgave it. Through the various volumes of 'Boswell' there occur many notices of Sheridan, but the Doctor's contempt is nowhere disguised. Sheridan continued to lecture, and was 'himself the great sublime he drew.' In Scotland he was honoured with so much attention that a society was formed, called 'The Society for Promoting the Reading and Speaking of the English Language in Scotland.' Among the directors were the names of Drs. Blair, Ferguson, and Robertson.

But by all his discussion and lecturing, his universal panacea for the ills of moral England came to be examined, and when in 1769 he proposed his 'plan of education for the young nobility and gentry of Great Britain,' he found the public enthusiasm already cooled. This plan was addressed to the king, in which with an amusing but lofty condescension he made a tender of his services, and offered to 'dedicate the remainder of his days to its execution,' observing, that 'if the design be not executed by myself, it never will be by any other hand.' But in spite of all this heroic dedication of services, he excited no notice. But this did not damp his ardour in the least. He endeavoured to support his plan by writing, by lecturing, and by tremendous sarcasms against the taste of the times which could so neglect him; and the whole farce is wound up by his resolution, on the declaration of the American Independence, of 'benefiting the new world with the advantages ungratefully neglected by his own country.'

In 1769, 1770, and 1776 he performed at the Haymarket and Covent Garden, his last appearance as an actor. On the retirement of Garrick the purchasers of the share in Drury Lane, of which his son was one, agreed to make him the manager; but he held the post only three years, when he relinquished it as not tenable except on ignominious terms. He then produced his 'Pronouncing Dictionary of the English Language,' which was ridiculed by Doctor Johnson, who thought an Irishman very unfit to teach the English their own language. But this was jealousy. His 'Life of Swift' followed—a heavy and indiscriminating performance. He died in the sixty-seventh year of his age, August 14, 1788.

His other works are the 'Course of Oratorical Lectures' and the farce of 'Captain O'Blunder.'

(*Life prefixed to the Dictionary*; Boswell's *Johnson*, *Biogr. Dramat.*; Chalmers's *Biogr. Dict.*; Moore's *Life of R. B. Sheridan*.)

SHERIDAN, FRANCES, wife to the above, was born in Ireland 1724, but of English parentage, being the granddaughter of Sir Oliver Chamberlayne. Her first acquaintance with Sheridan was curious enough. At one of his most embarrassing periods, when there had arisen a violent party dispute relative to the theatre in which he had newly embarked all his money and expectations, she published a well-written and forcible pamphlet in his favour, which disinterested kindness so excited his attention that he lost no time in being introduced to her—they were mutually pleased with each other, and the orator soon proposed marriage, and was accepted. She is uniformly described as a most accomplished and amiable woman, of whom Doctor Johnson was very fond (Boswell's *Johnson*, ii.), and whose novel of 'Sidney Biddulph' he greatly admired, addressing her the very flattering remark, that he doubted whether 'upon moral principles she was at liberty to put any one to so much pain as her story had put him.' Her 'Nourjahad' has delighted all readers of romance, and will continue to do so; though probably on other accounts than 'the excellent moral and inculcation of a future state of retribution' which so delighted James Boswell. She also wrote two comedies, 'The Discovery' and 'The Dupe,' but they are feeble and prosy, and are now become rarities.

She died at Blois, after a lingering illness, September, 1766. This date is on the authority of a letter of her husband's deploring that event, which is dated October, 1766; the 'Biographia Dramatica' and Chalmers's 'Biographical Dictionary' (which copies the former almost verbatim) place her death as late as 1767. Dr. Parr thus speaks of her in a letter: 'She was quite celestial; both her virtues and her genius were highly esteemed.'

(Moore's *Life of Sheridan*; *Biographia Dramatica*; Boswell's *Johnson*.)

SHERIDAN, RICHARD BRINSLEY BUTLER (for thus was he christened after Brinsley Butler, earl of Lanesborough, though he usually dropped the Butler), was the son of Thomas and Frances Sheridan. He was born in Dorset Street, Dublin (not at Quilca as the 'Biographical Dictionaries' declare), in September, 1751. He was educated at Dublin, and subsequently at Harrow, but at both places was pronounced to be 'an impenetrable dunce,' with whom neither severity nor indulgence could avail. On leaving Harrow indeed his ignorance was so great that he could not spell, and he wrote *think* for *thing*. At the age of eighteen however he joined his friend Halhed in a translation of the 'Epistles of Aristænetus.'

Sheridan's life was throughout a dramatic one; not in the high or poetical sense, but in that of intriguing comedy and practical joking, and he certainly displayed throughout as perfect a contempt for principle or sincerity as any comedy hero we could desire. His first important step in this life, marriage, was of this nature, and partakes of that intriguing spirit. His own brother and his friend Halhed were both in love with Miss Linley, an accomplished singer, then only sixteen; they confided their passion to him, but he outwitted them both, and eloped with the lady to France, where they were secretly married. He then fought a duel with a 'married blackguard who had worried and defamed her;' and then brought her back to England, where having extorted her father's permission, he repeated the nuptial ceremony by licence in 1773. They tell an anecdote of his driving her from the oratorios, disguised as a hackney coachman, during the interval of the two weddings, when she was residing with her angry friends and still pursuing her profession. Sheridan would not consent to his wife's employing her talents for their subsistence: it offended his pride, and this pride Dr. Johnson applauded, but very erroneously in our opinion. Yet Sheridan did not refuse to subsist, during the early part of their marriage, upon the three thousand pounds 'which a good-natured old gentleman had settled upon Miss Linley in default of being able to marry her.'

Necessity however soon drove him to literature, and in January, 1775, he produced his first comedy of 'The Rivals.' On the first night it was damned; but this was chiefly the fault of one of the actors and of those inexperiences which usually attend 'first nights,' and it soon met with the success which it so well deserved. In this comedy there is nothing new, and little that is true, but everything *tells* admirably. The incidents are various and bustling. The characters well opposed; though all, except the tetchy wayward Falkland, are copies of well-known originals. Mrs. Malaprop is not only a farcical exaggeration of Mrs. Slipslop (whose very jokes are easily perpetrated when once an author plunges into such a vein of impossible fun); but that mispronunciation which was natural in a housekeeper trying to be pedantic, is insupportable in the aunt of Lydia Languish. But Sheridan trusted very little to nature. Acres is quite as much a caricature; and Lydia Languish is so clumsily overdone as almost to fall pointless. Fag is a wit of the first order, dressed as a footman. Sir Anthony Absolute, though old, is nevertheless admirable, and cleverly sustained. To a severe criticism this comedy exhibits many faults, yet the same severity must admit its abundant merits of wit, animal spirits, situation, story, and selection of character.

The gaiety of success, and, as some say, gratitude to Mr. Clinch, who played Sir Lucius O'Trigger, but more probably the same pressing necessity, 'who has no law,' produced the farce of 'St. Patrick's Day, or the Scheming Lieutenant,' in the course of the ensuing spring. This farce turns upon the old trick of the lover deceiving the credulous father, a trick so often used by Molière, and imitated by every farce-writer since that immortal wit. The best thing in it is the character of Dr. Rosy, the sentimental physician, who moralises in the most imperturbable style: his lamentation for his departed wife is irresistible:—'Well, she's gone, never to return; and has left no pledge of our loves behind. No babe to hang like a label round papa's neck. Well, well, we all are mortal; sooner or later—flowers fade—flesh is grass.' The summer of that year was devoted to 'The Duenna,' which Hazlitt calls 'a perfect work of art. The songs are the best that ever were written, except those in the 'Beggar's Opera.' They have a joyous spirit of intoxication in them, and strains of the most melting tenderness.' But we must observe that neither incidents nor characters are new. The dialogue however is witty, terse, and polished. 'His table songs,' observes Leigh Hunt, 'are always admirable. When he was drinking wine, he was thoroughly in earnest.'

He was now in the full flush of popularity and prosperity, and became one of the proprietors of Drury Lane Theatre; but how, nobody can tell; for where he got the money, has ever remained an impenetrable secret. In the year 1777 he slightly altered Vanburgh's 'Relapse,' and produced it under the title of 'The Trip to Scarborough;' but his alterations are really so extremely trivial, consisting solely in one or two expurgations, that we wonder at the assurance of publishers who include it among his works, while at the same time they exclude 'The Stranger,' which is usually attributed to Mr. Thompson; yet Sheridan himself declared to Mr. Rogers, on two different occasions, that he wrote every word of it. (Moore's *Life of Sheridan*, ii., p. 275.)

In 1777 also he produced 'The School for Scandal,' of which Leigh Hunt remarks, 'with the exception of too great a length of dialogue without action in its earlier scenes, it is a very concentration and crystallization of all that is sparkling, clear, and compact, in the materials of prose comedy.' The characters, though not new, are generally well drawn, and inimitably selected. Selection is one of the first arts of a dramatist. Having to illustrate a moral or develope a problem, his great care should be that the characters which he selects do really of themselves go towards the building up and elucidation of the whole. Thus Sir Peter and Sir Oliver, Charles and Joseph, Mrs. Candour and Lady Sneerwell, with Sir Benjamin, Snake, Crabtree, &c., have each a distinct part in the drama. Of these we prefer Mrs. Candour, who is exquisitely drawn, and who serves to turn the balance in favour of Sheridan's scandal-scene, in comparison with the scene in Wycherley's 'Plain Dealer' (Act ii., sc. 1), from which it is imitated. Charles Surface is a very disagreeable and boasting character, and destitute of the honourable or gentlemanly feeling to which he pretends. He is not only an unprincipled spendthrift, but he attempts to carry it off with a high hand, and with maxims which may be well enough over the bottle, but are foolish sophisms when applied in life: thus when he has money, he prefers sending it to Mr. Stanley, who has applied to him for charity, than to his lawful creditors; and swaggers off with 'Justice is an old lame hobbling beldame, and I can't get *her* to keep pace with generosity for the soul of me.' His treatment of Lady Teazle in the screen-scene is still more offensive. Charles has a cant about him as well as Joseph; but he is always a favourite with the audience, because he is, or pretends to be, a dashing fellow of the very best intentions, and only addicted to cheating his tradesmen out of a little pardonable sociality. A rake is always sure of the sympathies of the pit and boxes; and the very tailor who perhaps in real life 'suffers' most from such characters, applauds the loudest. To him Charles Surface has a dashing captivating immunity from the laws of common honesty. 'The School for Scandal' however remains the finest model of the wit-comedy in the language: it has not the heartiness, the flesh and blood vitality of the 'Beaux Stratagem,' nor the more elaborate wit of Congreve; its language is more polished and exquisite than Farquhar's, and more easy and less obviously elaborate than Congreve's; but all three dwindle into insignificance beside the poetic comedy of Shakspere.

In 1779 he wrote the 'Critic,' one of the wittiest farces in the language. 'In some of its most admired passages, little better than an exquisite cento of the wit of the satirists before him. Sheridan must have felt himself emphatically at home in a production of this kind; for there was every call in it upon the powers he abounded in—wit, banter, and style; and none upon his good nature.' (Leigh Hunt, *Critical Sketch prefixed to Sheridan's Works.*) But indeed it has need of all its brilliant writing to support the length of the dialogne without action; and when it comes to the rehearsal of the tragedy, it soon becomes tiresome. Good acting however will always keep it on the stage.

Sheridan's political career was illuminated by a few bright flashes of eloquence and perpetual wit, but he had neither the depth nor the perseverance of a statesman; and consequently, though he sometimes helped his party with a promising effort, 'gradually degenerated into a useless though amusing speaker, familiarly joked at by the public, admired but disesteemed by his friends.' He had made the acquaintance of Charles James Fox, through whose good offices he got elected for the borough of Stafford in 1780. His connection with Fox, more than any decided opinions of his own led him to support the Whig party, to which he continued faithful to the last. Under the Rockingham administration he became under-secretary of state, but resigned on the death of the marquis. His celebrated speech on the occasion of Warren Hastings's trial was a tremendous effort of eloquence, and will never be forgotten.

In 1792 Sheridan's wife died; and in 1795, being then in his forty-fourth year, he married Miss Ogle, the dean of Winchester's daughter—'young, accomplished, and ardently devoted to him.' She brought him five thousand pounds, and with this and fifteen thousand more which he contrived to raise by the sale of Drury Lane shares, an estate was bought in Surrey, where he was to live in love and happiness till his drink and his duns could endure it no longer. After an interval of nine years since his last play, he again, in 1798, contributed to the stage the 'Stranger' and 'Pizarro,' both adaptations from wretched pieces of Kotzebue. 'It is observable,' says his last critic, 'however, and not a little edifying to observe, that when those who excel in a spirit of satire above everything else come to attempt serious specimens of the poetry and romance whose exaggerations they ridicule, they make ridiculous mistakes of their own, and of the very same kind, so allied is habitual want of faith with want of all higher power.'

Sheridan's theatrical career terminated with these pieces; and now his prospects seemed every day more lowering. His difficulties always great, became now insupportable from the want of health, youth, and animal spirits to prompt him to fresh exertions, or to enable him to bear them with better grace. He lived in a perpetual but inefficient struggle; resorting to many a degrading shift, which may tell well enough as jokes, but which preyed upon him seriously enough. His friends (among them the prince-regent, his former boon companion, whose dull pompous entertainments were enlivened by Sheridan's wit) had forsaken him now that sickness and distress had enfeebled the brilliancy and animation of his conversation. Money was no longer to be borrowed; duns were no longer to be pacified with promises; everything was indicating ruin, and he died near his dying wife, amidst the threats of bailiffs, and deserted by all but his physician Dr. Bain, and his poetical friends Mr. Rogers, Mr. Thomas Moore, and Lord Holland, on Sunday, the 7th of July, 1816, in Saville Row, Burlington Gardens, in the sixty-fifth year of his age.

'It is a remarkable and painful instance,' observes his critic, 'of the predominance of the conventional and superficial in his feelings, even when they were most strongly and deeply excited, that after going through life with a laughing carelessness as to troubles far more humiliating, he burst into tears, and complained of his 'person' being 'degraded' because a bailiff had touched him! That word 'person' expresses all."

Moore's *Life of Sheridan*; Leigh Hunt's *Biographical and Critical Sketch*, prefixed to Moxon's edition of Sheridan's *Works*; Boswell's *Johnson*; *Biographia Dramatica*; Hazlitt's *Lectures on the Comic Writers*.)

SHERIF, an Arabic word which means 'noble, illustrious,' and a title given throughout Arabia, Egypt, and Barbary, to those who are descended from the Mohammedan prophet. In Turkey they are called amírs, *i.e.* princes, and enjoy great privileges, such as not being subject to the payment of taxes; not being obliged to appear before a judge, unless he be one of their class; wearing a green turban and slippers; occupying a superior place in the mosque, &c. As men and women of this caste often contract marriage with persons who are not members of the same, and the title of sherif is inherited from either of the parents, the number of persons who enjoy this distinction has become very considerable in Turkey, Syria, and Egypt, where they may be found employed in the lowest offices. It is one of the privileges of Mecca to be governed by a sherif of the posterity of Hasan, son of Ali Ibn Abí Talib, which family enjoys the sole right to the throne. His dominions comprehend, besides the capital [MECCA] Medina, Jambo, Tayif, Sadie, Gbunfude, Hali, and thirteen other smaller districts, all situated in the Hejáz. His principal revenue consists of a tax imposed upon every pilgrim, and the presents made by Mohammedan princes.

About the beginning of the sixteenth century an adventurer, named Mohammed Ibn Ahmed, who pretended to be descended in a right line from Huseyn, son of Ali Ibn Abí Talib, the cousin and son-in-law of the prophet, became the founder of a dynasty known in history as the 'First Dynasty of the Sherifs,' to distinguish it from another more recent, which African writers designate under the name of *Daulah Ash-shorafá Al-fileliin* ('the Dynasty of the Sherifs of Tafilet'). To the latter belongs Abú-l-fadhl Abdu-r-rahmán, who now occupies the throne of Marocco. Having obtained from Mohammed Al-watás, sultan of Fez, the investiture of the provinces of Dukelah and Sús, under the pretence of waging war against the Portuguese, who then occupied the greater part of that country, known under the antient name of Mauritania Tingitana, Mohammed declared himself independent in his government. At his death, in 1517, his dominions were divided among his three sons, Abdu-l-kebir, Ahmed, and Mohammed. The first was killed in a skirmish with the Portuguese. Ahmed became king of Marocco, which city he took from Abú-shantuf (Bujentuf). The other brother, Mohammed, who was king of Terudant, after considerably extending his dominions, made war on his brother Ahmed, whom be deprived of his states; and in 1548 he took possession of Fez. At his death, in 1557, Mohammed was succeeded by his son Abdullah, who reigned till 1574, when he was assassinated at Alguer by the Turks who composed his own body-guard. His son Mohammed II., surnamed Al-muntaser and Al-aswad (the black), because he was the son of a negress, was dethroned in 1576 by his uncle Abdu-l-málik, against whom Don Sebastian, king of Portugal, fought the battle of Alcassar. [SEBASTIAN.] Abdu-l-málik was succeeded by his son Ahmed, surnamed Abú-l abbás Al-mansúr, the greatest monarch of his race, who died in 1603, after a long and prosperous reign. His son Abú Fáris Abdu-l-azíz succeeded; but he was dethroned in 1607 by his younger brother Zidán, who had with him a body of English auxiliaries under the command of John Gifford. Zidán was a just and benevolent monarch, and a patron of literature, which he himself cultivated with success. A large library which he had collected was taken by the Spaniards on board one of his galleys, and given to the monks of the Escurial. (Casiri, *Bib. Ar. Hisp. Esc.*, vol. i., p. 5.) At his death, in 1630, his son Abdú-l-malek II. succeeded him. The other sovereigns of this dynasty were Abdú-l-malik III. (1630-35), Al-walid (1635-46), and Ahmed II., surnamed Ash-sheikh (the old man), all three sons of Zidán. The last was put to death in 1665 by an adventurer named Krom Al-háj, who usurped the throne, but was assassinated in 1667, and succeeded by his son Muley Sheikh.

During the reign of Zidán (1607-30), Muley Ali, a native of Jambo in Arabia, and a descendant of the prophet, revolted at the city of Tefilel (improperly called Tafilet), where he resided, and assumed the title of sultan. This Ali pretended to be issued in a straight line from Yúsuf, the brother of Mohammed Ibn Ahmed, the founder of the first dynasty of the sherifs, whose posterity had remained in Arabia. At his death, in 1632, Ali was succeeded by his son Mohammed, who, in 1664, was dethroned by his own brother Ar-rashíd. This prince, who possessed mamy brilliant qualities, united under his rule all the dominions which had formerly belonged to the sherifs of the first dynasty. He died March 27, 1672, after a reign of eight years, and was succeeded by his brother Ismail, under whose reign, which lasted fifty-five years, Tangiers was evacuated by the English. At his death (March 27, 1727) his son Ahmed, surnamed *Adh-dhahebí* (the golden), owing to his great avarice and the considerable treasure he amassed, succeeded him. He was strangled in 1729, after a reign of nearly two years. The reign of his brother and successor Abdullah, at whose court the celebrated Ripperdá found an asylum [RIPPERDA], was one of perpetual strife and civil war. Five times he was deposed, or compelled to abandon the capital of his dominions, and as many times he regained possession of it. Having at last, in 1742, rid himself of all competitors for the crown, he reigned undisturbed until his death, in 1757. His son and successor Síd Mohammed was a very able monarch. He encouraged trade and agriculture, made treaties with several European nations, and admitted foreigners to his court. He died April 11, 1789, at the age of eighty-one. His eldest son Mohammed Mahdi Al-yezíd only reigned twenty-two months, being killed on the 15th Feb., 1792, in a battle against his own brother Hishám, who disputed the empire with him. He was succeeded by his brother Abú-r-rabi Suleyman, who occupied the throne till his death in 1822, when he appointed his nephew Abú-l-fadhl Abdú-r-rahman, son of Hishám, to be his successor, who now reigns over the whole of Western Africa, from the frontiers of the province of Telemsán to the river Nún in the desert.

There is a good history of the first sherifs by Diego de Torres, who was an eye-witness of most of the events which he describes (*Relaçion del Origen y Successo de los Xarifes y del Estado de los Reynos de Marruecos, Fez, y Tarudante*, Sevilla, 1586, 4to.). Much useful information may also be gleaned from the following works:—Marmol Carvajàl, *Descripcion General de Africa*, Granada, 1573, fol.; Meneses, *Historia de Tangere*, Lisb., 1732; Jackson's *Account of Marocco*, Lond., 1809, 4to.; Graberg di Hemso, *Specchio Geografico e Statistico dell' Impero di Marocco*; Chenier, *Recherches sur les Maures*, Paris, 1787, 8vo.

SHERIF-ED-DEEN (*Moollah Ali Sherîf-ed-deen Yezdi*) a native of Yezd in Persia, and a celebrated Persian historian, who flourished about the beginning of the fifteenth century of our æra. Few particulars have reached us as to his parentage or personal history. He was by profession a doctor of the Moslem law, and appears to have resided principally at the court of Shiraz, under the patronage of Ibraham Sultan, who acted as viceroy of Fars for his father Shah-Rokh, the youngest son and successor of Timour. Here Sherif-ed-deen completed, A.D. 1424 (A.H. 329), the work on which his reputation is principally based, entitled the 'Zuffer-Nameh,' or 'Book of Victories,' which gives, in the Persian language, a detailed and copious account of the life, reign, and conquests of Timour, drawn from the authentic records in the possession of his descendants. The first part, or introduction, however does not exist in any copy found in European libraries; and we are acquainted with it only through the quotations of Hadji-Khalfa, who mentions it as containing an excellent account of the geography of Zagatai, or Turkestan, with genealogical notices of the various tribes. The style of the 'Zuffer-Nameh' is characterised by Sir William Jones as 'most beautiful and elegant;' and Khondemir compares the diction to 'a sparkling succession of pearls, diamonds, and precious stones;' but a European reader is fatigued by the endless metaphors and profusion of laboured ornaments with which every phrase is overloaded. 'His geography and chronology,' says Gibbon, 'are wonderfully accurate; and he may be trusted for public facts, though he servilely praises the virtue and fortune of his hero. His encomiums on Timour are indeed carried to the most fulsome extent of oriental panegyric; but both gratitude and interest would combine to produce this effect; and the bias thus shown is in some measure useful as enabling us to qualify the equally exaggerated invectives of another biographer of Timour, the Syrian Arabshah. A French version of the 'Zuffer-Nameh' was published at Paris, 1722, in four vols. 12mo., by M. Petis de la Croix, under the title of 'Histoire de Timur-Bec, connu sous le nom du grand Tamerlane, Empereur des Mogols et Tartares,' &c.; but it is far from being a close translation of the original. A Turkish version has also been printed at the imperial press of Constantinople.

SHERIFF, the Shire-Reve (scyr-gerefa), from the Saxon word *reafan*, 'to levy, to seize,' whence also greve. The German word is *graf*. The gerefa seems to have been a fiscal officer. In the Saxon period he represented the lord of a district, whether township or hundred, at the folkmote of the county; and within his district he levied the lord's dues, and performed some of his judicial functions. (Palgrave, *Rise and Progr.*, i. 82.) He was usually not appointed by the lord, but elected by the freeholders of the district; and (accompanied by four of them) was required to be present on its behalf, as well as on the lord's, at the folkmote or county court. In like manner the Saxon prince or king employed in the shires or larger districts his gerefa or reve, who levied his dues, fines, and amerciaments; to whom his writs were addressed; who exercised on his behalf regal rights in the shire, for the preservation of the peace and the punishment of offenders; presided over the courts-leet or views of frankpledge, and (at least in the absence of the earl in antient times, and since the Conquest instead of the earl) presided over the hundred and county courts. It is difficult to determine how far the functions of the sheriff were concurrent with and how far derived from the ealderman or earl of Saxon and Danish times; and the confusion between these offices has been increased by the translation, in our antient laws, of the word sheriff in the Latin into *vice comes*, and in Norman French into *visconte* or *viscount* (deputy of the earl); whereas certainly many of the sheriff's powers even in Saxon times were derived from the freeholders, or from the crown alone, and the word graf (gerefa) in German was equivalent to our earl. That before and for a century after the Conquest the sheriff had powers independent of the earl, is obvious from the fact, that in the circuit (tourn) which he made periodically (Spelman's *Gl.*, 'Vice Comes') of his shire for the administration of justice (as the Saxon king made a circuit of his realm), he was accompanied not only by the freeholders, but by the bishop, the earl, and barons, until these noblemen were exempted from the duty by statute 52 Henry III., c. 10 (A.D. 1267). [Earl; Courts; Shire.]

Sometimes the shrievalty, by grant of the crown, was hereditary; it was also often held for life, or for many years, and there were sometimes more sheriffs than one in a county, the persons chosen for the office being, according to Spelman, 'totius regni proceres:' but the sheriff was usually chosen by the freeholders of the shire. The statute 28 Edward I., c. 8, which says that 'the king hath granted unto his people that they shall have election of their sheriff in every shire (where the sheriff is not fixed in fee) if they list,' is rather declaratory of the people's right than a grant of a new privilege. By the 14 Edward III., c. 7, it is enacted that no sheriff tarry in his bailiwick more than a year, and then another, who hath land sufficient in his bailiwick, shall be ordained on the morrow of All Souls (3rd November) by the chancellor, treasurer, and chief baron of the exchequer, taking to them the chief justices of either bench if they be present.

At present the crown in most cases appoints the sheriffs, and also fills up any vacancy which is occasioned by the death of a sheriff during his year of office. To some corporations of cities which are counties of themselves charters have given the power to elect their own sheriffs; and the city of London has the perpetual right to elect the sheriff of Middlesex. In the county of Durham the bishop was sheriff until he was deprived of palatine powers in 1836; and in Westmoreland the office is hereditary in the family of the earl of Thanet as heir-general of the Viponts, to whom the shrievalty was granted by King John. The annual appointment of sheriffs is now in most counties made thus:—On the morrow of St. Martin (12th November), the lord chancellor, first lord of the treasury, and chancellor of the exchequer, together with all the judges of the three courts of common law, meet in the exchequer chamber, the chancellor of the exchequer presiding. The judges then report the names of three fit persons in each county, and of these the first on the list is chosen, unless he assigns good reasons for exemption. The list thus made is again considered at a meeting of the Cabinet held on the morrow of the Purification (3rd February), at the president of the council's, and attended by the clerks of the council, when the excuses of the parties nominated are again examined, and the names are finally determined on for the approval of the queen, who, at a meeting of the privy council, pierces the parchment with a punch opposite the name of the person selected for each county; and hence has arisen the expression of 'pricking the sheriffs.' The judges of assize annually add the requisite number of names to their lists by inserting those of persons recommended by the sheriff going out of office.

The sheriff derives his authority from two patents, one of which commits to him the custody of the county, and the other commands the inhabitants to aid him. He takes an oath of office, the greater part of which relates to his collection of the crown revenue, and he gives security to the crown that he will duly account. He then appoints an under-sheriff, by whom in fact the duties of the office are performed. These duties are various and important. Lord Coke quaintly says that the sheriff has a triple custody—1st, of the *life of justice*, because to him are addressed the writs commencing all actions, and he returns the juries for the trial of men's lives, liberties, lands, and goods; 2ndly, of the *life of the law*, because he executes judgments of the courts; and 3rdly, of the *life of the republic*, because he is in his county the principal conservator of the peace. He presides in his own court as a judge, and he not only tries all causes of 40*s*. in value, but also much larger questions under the writ of scire facias. [Scire facias.] By Magna Charta he is prohibited from holding pleas of the crown. He presides at all elections of members of parliament and coroners, and hence he cannot during the year of his office be elected a knight of the shire. He apprehends all wrong doers, and for that purpose, in criminal cases, he is entitled to break open outer doors to seize the offender; he defends the county against riot or rebellion or invasion [Lord Lieutenant], and to this end may require the assistance of all persons in it who are more than fifteen years of age, and who, when thus assembled under the sheriff's command, are called the *posse comitatûs*. [Posse Comitatus.] To refuse to the sheriff the aid which he requires is an offence punishable by fine and imprisonment. The sheriff takes precedence of all persons in the county. He seizes all lands which have fallen to the crown, and levies all fines and forfeitures; but he is not permitted to act as a justice of the peace. He executes all writs that issue from the superior courts, whether they are writs that commence an action or writs of execution; he is likewise responsible for the execution of criminals. He receives and entertains the judges of assize, on whom he is constantly in attendance whilst they remain in his shire.

To assist him in the performance of his duties, the sheriff employs an under-sheriff and also a bailiff and gaolers, from whom he takes security for their good conduct. He is prohibited by very antient statutes from selling his office or the profits of any part of it.

The liability of the sheriff for breach or neglect of his duties is a frequent source of litigation. Few assizes occur without actions being brought against him for illegal arrests or levies, or for wrongfully abstaining from executing the process addressed to him. Thus the decisions affecting him are numerous and complicated, and there are many treatises concerning the office, of which Dalton's 'Office and Authority of Sheriff' (1682) is the most relied on. [Shire; Earl.]

(Spelman's *Glossary*, articles 'Graphio,' 'Comes,' 'Vice-Comes;' *Coke upon Littleton*, Hargr. and Thomas's edition, vol. i.; Bacon's *Abridgement*; Palgrave's *Rise and Progress of the English Constitution*, i.)

SHERLOCK, WILLIAM, D.D., born about 1641, died 1707, father of Dr. Thomas Sherlock, bishop of London. Dr. Sherlock, the father, was born in Southwark, and studied at Peter House, Cambridge; at an early period of life he had the living of Saint George, Botolph-lane. In 1681 he obtained the prebend of St. Pancras, in the church of St. Paul's, London; and in 1684 or 1685 was elected master of the Temple. His political conduct at the Revolution is said to have been as ambiguous as that of his son on the accession of the house of Hanover, and he exposed himself to the severe censure of the Jacobite party, who had hoped to retain him. It was on this occasion that he published his 'Case of the Allegiance due to the Sovereign Powers.' He appears however to have been little favoured by the new government, for he remained with no other eminent preferment than that of master of the Temple till his death at the age of 66.

Dr. Sherlock was much occupied in the theological controversies of the time, of which the most remarkable was that in which he and Dr. South engaged on the nature of the Trinity. His writings are very numerous; but it may be sufficient to add that he is the author of the work entitled 'A practical Discourse concerning Death,' a very popular book, which has gone through numerous editions.

SHERLOCK, THOMAS, son of Dr. William Sherlock, born 1678, died 1761, an eminent prelate of the English church, of whom there is a Life prefixed to an edition of his Sermons published in 1775. He was born in London, and educated at Eton, from whence he passed to Catherine Hall, Cambridge, of which college in due time he became master, and in 1714 was vice-chancellor of the university. Before this time, namely in 1704, he had been made master of the Temple, on the resignation of his father, which office he held for nearly fifty years, constantly preaching and highly esteemed. His political conduct was thought to be a little ambiguous at the beginning of the reign of George I., but he soon gave in his adhesion to the new family, and in November, 1715, began his course of preferment in the higher dignities of the church, being made dean of the cathedral church of Chichester. Yet he was always devoted to Tory politics, defended strenuously the Test and Corporation Acts, and was the most formidable opponent whom Dr. Hoadly had to encounter in what is called the Bangorian controversy. His conduct in this controversy was so offensive at court that he was removed from the list of king's chaplains in 1717. In the controversies which arose at that period respecting the proofs of the divine origin of Christianity, Dr. Sherlock distinguished himself by his valuable writings, particularly his 'Use and Intent of Prophecy,' and his 'Trial of the Witnesses of the Resurrection of Jesus,' which is a masterly reply to the objections of those who reject the evidence of miracles, and particularly to those of Woolston. In 1727 he was made bishop of Bangor, and was translated to Salisbury in 1734. His learning and eloquence gave him considerable weight in the debates of the House of Lords, and his reputation both as a divine and a ruler in the church was so great that in 1747 the archbishopric of Canterbury was offered to his acceptance, but declined by him on account of the state of his health. In the next year however he accepted the bishopric of London, and became engaged in a dispute with the new archbishop (Herring) respecting the option, the archbishop having fixed on the church of St. George, Hanover-square. In 1753 he resigned the mastership of the Temple, being then old and infirm. In 1755 and 1756 he revised and corrected a large body of his sermons, which were published in those years, in four octavo volumes, to which a fifth was afterwards added. Duties such as these were at that period nearly all that he was able to perform, being almost wholly deprived of speech and of the use of his limbs. When he died, in 1761, he had completed his eighty-third year. He was buried in the churchyard of Fulham.

SHERWIN, JOHN KEYSE. The history of this artist presents an example of the power of talent to make its way through all obstacles. He was a native of Sussex, and of very humble origin. When about eighteen or nineteen[*] years old, he was employed as a woodcutter on the estate of Mr. Mitford, near Petworth. He had occasion to enter the parlour one day on business, when he saw some members of the family engaged in drawing, and, as it was observed that he paid more than ordinary attention to the process, he was asked whether he could do anything in that way. His answer intimated a desire to make the attempt; and a port-crayon was put into his hand. It is related that his hands were so stiff and callous with hard labour, that, when a penknife was offered him for the purpose of sharpening the point of his crayon, he was unable to use it, and it slipped through his horny fingers. He nevertheless produced a drawing which greatly surprised Mr. Mitford, and which, being sent to the Society of Arts, probably accompanied with an account of the circumstances under which it was executed, obtained their silver pallet as a reward. He then removed to London, and became a pupil of Ashley, a painter in some repute at that time; but who shortly afterwards married a lady of title, and abandoned the arts. Upon this Sherwin placed himself under Bartolozzi, and made rapid progress in designing and engraving. The biographical notice in the 'Gentleman's Magazine' states that he carried off both the silver and gold medals from all the students of the Royal Academy; and we learn from the records of the Society of Arts that in 1774 and 1775 he received two prizes of twenty guineas each for engravings from designs by himself, and in 1778 obtained their gold medal for excellence in engraving. On the death of Woollett, in 1785, Sherwin was appointed engraver to the king. Although he displayed considerable talent in design, it is as an engraver that his reputation stands highest. He engraved both historical subjects and portraits, and attained a degree of excellence that is truly surprising when the circumstances of his early life are considered. He commenced a very large picture in oil-colours, representing the installation of the knights of St. Patrick; but as far as it was proceeded with, it proved, according to Dayes, 'a wretched daub.' He died September 20, 1790.

It is to be regretted that the extraordinary talents of Sherwin, and the great encouragement he received, were not duly improved by him. Dayes, in his 'Professional Sketches of modern Artists,' states that he 'possessed all that impudent assurance necessary to pushing his fortune in society; but what his forwardness procured, his folly lost; as, in the end, he disgusted all his friends, among whom were some of the principal nobility;' and he adds that, by running into excesses, he impaired his constitution and embarrassed his affairs, and died under most melancholy circumstances.

(*Gent. Mag.* for 1790 and 1791; *Works* of Edward Dayes; Bryan's *Dictionary*, &c.)

SHETLAND, THE ISLES OF, form a distinct and the most remote and northerly group of islands incorporated with Great Britain. They are situate about 150 miles from the headland of Buchanness on the Aberdeen coast, and are nearly one hundred miles beyond the centre of the Orkney Islands. Excluding the two more detached islands of the group, called Foula and Fair Isle, the Shetland Isles lie between 59° 48′ and 60° 52′ N. lat., and between 52′ and 1° 57′ W. long. Foula is computed to be twenty miles to the west of the Mainland of Shetland, and Fair-Isle to be twenty-five miles south-south-west of the nearest headland of the Mainland.

The Shetland group consists of more than one hundred islands, islets, holms, and skerries, about thirty of which are inhabited; the others are either small verdant isles, on which cattle and sheep are pastured, or sterile masses of rock. The largest of the Shetland Isles, called the Mainland, is about sixty miles long, direct distance, from its northern extremity at Feideland to its southern termination at Sumburgh Head. The breadth of this island is very unequal, and varies in general from three to five and ten miles: at one part, from Sandness to the point opposite to the Noup of Nesting, the breadth is twenty-four miles; and at the narrow isthmus of Mavis Grind, the breadth is only about one hundred yards. The coasts of the Mainland are singularly irregular and broken, being indented with innumerable arms of the sea, or deep bays, universally distinguished by the provincial term of *Voes*, which penetrate into and intersect the interior parts of this singular island in such a manner, that in traversing it, a traveller cannot find himself, at any one point, farther than three miles from one or more of these voes, or of the open sea. The next largest island is Yell, being about twenty miles in length and six miles in breadth. Unst is the third largest island, and is about eleven miles long and six miles broad. The other islands are comparatively small: the largest are Fetlar, Whalsey, Bressay, Papa-Stour, Meikle-Roe, Burra, Foula, and Fair-Isle.

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[*] The memoir in the 'Gentleman's Magazine' states that he was about *nineteen* at this time, but in Dossie's 'Memoirs of Agriculture and other Œconomical Arts,' vol. iii., where the first reward he received from the Society of Arts is recorded, it is stated to have been given in 1769, and Sherwin's age is given as *thirteen*. This is probably a misprint for *eighteen*, which would agree sufficiently with the ordinary account.

All the Shetland Isles are at present divided into twelve parishes, which form two presbyteries of the church of Scotland, viz. the presbytery of Lerwick and the presbytery of Burravoe, and which, united, constitute the synod of Shetland. The parishes, with their population in 1831, are:—

In the presbytery of Lerwick.

	Population.	
1. *Bressay*, including Burra and the government church of Quarff . .	1,699	
2. *Dunrossness*, including Coningsburgh, Fair-Isle, and the government church of Sandwick	4,405	
3. *Lerwick*, including Gulberwick .	3,194	
4. *Sandsting*, including Aithsting, and the islands of Vemensting and Papa-Little	2,194	
5. *Tingwall*, including the old parishes of Whiteness and Weisdale . .	2,794	
6. *Walls*, including the island of Foula, and the old parishes of Sandness and Papa-Stour	2,146	
		16,432

In the presbytery of Burravoe.

1. *Delting*, or Olnafirth, or South Kirk	2,070	
2. *Fetlar*, including North Yell . .	1,680	
3. *Nesting*, including the old parish of Lunnasting, and the islands of Whalsey and Skerries	2,103	
4. *Northmavine*, formerly Hillswick, and having annexed Olla Berry, Northrew, and Ashness	2,386	
5. *Unst*, formed of the islands of Unst and Uyea	2,909	
6. *Yell*, formed of the old parishes of Mid and South Yell, and the islands of Biga, Samphrey, and Hascassy. It has three kirks—Hamnabo, or South Kirk; Retfirth, or Middle Kirk; and Glupe, or North Kirk	1,812	
		12,960
Total population . .		29,392

The general appearance of the Shetland Isles, as seen from sea, is a lumpy and unvarying line of abrupt coast. The elevation of the highest parts is not remarkable: Roeness Hill, with an altitude of 1500 feet, is the highest hill in the Mainland and of Shetland. Foula is distinguished from the other islands by a cluster of five lofty hills, terminating in pointed cones, called the Noup, Liora-field, the Sneng, Comma-field, and the Kaim, the last of which is the highest, and rises to the height of nearly 1400 feet. The surface of the islands is particularly rugged and wild, and not unfrequently bears the appearance of desolation and sterility. Tracts of cultivated and fertile land, generally near the voes and the sea-coasts, with rich pastures and bright green meadows, are pleasing exceptions to this general character of the country: and the majestic cliffs and towering headlands that frown over the dark and stormy seas and *rousts* (as the turbulent surges raised by the conflicting currents and torrents that sweep round the headlands are called); the numerous detached and very singular pyramids of rock that rise to a great elevation along several parts of the coast; and the openings of innumerable lofty and dark caverns in the cliffs and precipices of the coast—some of great beauty, and others of gloomy grandeur—are, either separately or grouped together, very magnificent and highly picturesque features.

The tides, which partly occasion the rousts off the headlands, are also remarkable for their unequal flow at different parts of the islands, and in opposite or various directions at the same period of time, a phenomenon occasioned probably by the impulse which they receive from the position of the channels or *sounds* between the islands, and the projection of the headlands and angular turnings of the sea-coast. Thus the tide flows about an hour earlier along the western coasts than on the eastern sides of the islands, and does not recede below high-water mark more than two-third parts of the depth of the ebb tide at the Orkney Islands. This last circumstance, and the steep inclination of the shores, which render access to seaward so difficult and circumscribed, limited the manufacture of kelp in Shetland to a very few hundred tons annually, even when that article obtained a high remunerating price in the market.

The agriculture and rural economy of the Shetland Isles have been at all times conducted in a primitive and rude manner. The culture of the soil is a secondary consideration both to landlords and tenants, who direct their attention chiefly to the prosecution of the valuable fisheries in their neighbourhood; and, consequently, the small tenants, all of whom are fishermen, have merely a small proportion of arable land, enough to enable them to raise a scanty supply of food for themselves and their families, and to allow them to devote the best part of their time to fishing. The lands are also let under condition that the landlord is to receive all the fish caught by his tenants at a certain fixed price, which enables him to derive a profit from the re-sale of it; while on the other hand the landlord is the purveyor of the tenant's fishing materials, and often of a great proportion of his food, upon which a profit also arises.

Under such a system agricultural improvements cannot be expected. The tenant also has no lease, which, if granted on reasonable terms, might stimulate him to active exertions. The delivery of perquisites to the landlord, such as fixed quantities of butter and oil and hides; and the exaction of small tithes and personal labour, in addition to the rents of their small farms, have a further effect in cramping the industry of the tenants. The climate moreover is so precarious and humid, and so ill adapted to the successful raising of corn, that, although the soil of the arable land is in several places very good, only the hardiest and most common descriptions of barley and oats are cultivated. The extent of arable land throughout all the islands, including all the detached patches, is estimated at 28,000 acres. Connected with the rural affairs of Shetland, the diminutive race of horses, cattle, and sheep peculiar to these islands require notice. The native cow is a very small animal, with long pointed horns, and is generally of more than one colour, dingy white and brown predominating. Three hundredweight may be said to be above, rather than under, the average weight of an ordinary Shetland cow, and three English quarts per day is the utmost quantity of milk that she yields. About 22,000 of these animals, young and old, are distributed through the islands. The 'Shetland pony' is now well known throughout the kingdom, being annually exported in great numbers. These diminutive horses, of which about 12,000 are supposed to be maintained in Shetland, are only from nine to eleven hands high. They are extremely hardy and vigorous, and undergo much fatigue in proportion to their size. They are invariably left to provide their food from the hill pastures, and are never placed under the shelter of a stable either by day or by night, in summer or in winter. The native sheep may almost be termed a wild animal. They are also remarkably small, and never experiencing the care or protection of a shepherd, have acquired a degree of nimbleness and vigilance which would be considered foreign to the nature of the animal by persons who are only acquainted with the tended flocks of other countries. The carcass of one of these animals weighs only about thirty pounds. The colour of their wool, from which stockings and gloves of a beautifully fine description are knit by the natives, and are eagerly sought after at high prices, is various, being white, dun, black, and brown, and all these colours often blended together in one animal. About 80,000 is the computed number of sheep in the Shetland Isles.

The fisheries of Shetland are the most important branch of industry, and the staple sources of the wealth of the inhabitants. *Sillocks*, the young of the coal-fish, literally swarm from the month of May until September, close to the rocky shores, and in the voes and bays, affording abundance of a favourite food, and considerable quantities of oil. The ling and tusk fishery, in the open sea, is the most valuable and most hazardous, and, together with the cod fishery, contributes more to the prosperity of Shetland than any other. The herring fishery is not conducted on the same scale or with the same success in Shetland as in Orkney, or on the coast of Caithness, but it is still a valuable branch of industry here; and the occasional capture of whole herds of a species of whale, here known as 'Ca'ing Whales' or 'Bottle Noses,' which approach the coast in pursuit of the herring shoals, is considered an exhilarating pastime by the natives, and supplies them annually with oil of very fine quality. The slaughter of seals in the deep caverns of the sea-coast is also engaged in, to an extent sufficient to class it among the Shetland fisheries.

Dr. Hibbert published, in 1822, 'A Minute Account of the Geology of the Shetland Isles.' The great varieties of rock, their relative position to each other, and the facilities with which they may be observed throughout the Isles of Shetland, are replete with interest. The southern part of the Mainland is composed of a ridge of clay-slate lying parallel to secondary sandstone and conglomerate on the one side, and small islands of gneiss and sienite on the other. The centre of the Mainland is a solid mass of gneiss, having bluish grey quartz on the west side, and districts of sienitic greenstone and granite to the north. The island of Yell is formed of gneiss; and Unst is chiefly formed of serpentine and diallage rock, bordering on a district of gneiss and another of micaceous slate. The island of Fetlar is similar to that of Unst; and the more remote island of Foula is formed of high hills of sandstone, with clay and mica slate, gneiss and granite on its north-eastern shores; and Fair-Isle also chiefly consists of sandstone.

There are copper-veins at Sandlodge and in Fair Isle; iron mica at Titfield-head; iron pyrites at Garthness; the chromate of iron in Unst and Fetlar; the hydrate of magnesia in the serpentine of Swinaness in Unst; and garnets, actinolite, amianthus, and cyanite in various places.

The great number and variety of sea-fowl that frequent Shetland render the ornithology of the district an interesting study. The sea-eagle, here called *Bonxie*, or *Scua-gull*, rears its young in the high hills of Foula and other elevated places. The great owl, provincially *Katogle;* the arctic or parasitic gull; the cormorant; guillemots, lyres or shearwaters, kittywakes, sheldrakes, terns, sea-hawks, and a vast variety of similar birds, are all common to the country.

With the exception of plants common in most meadows, and in ordinary and hill pastures, the botany of Shetland is very circumscribed.

This northern region is subject to severe and long continued storms; and while winter may be said to commence in the month of October, the return of spring is almost imperceptible till the end of April. The climate throughout the year is variable and humid, but to the natives it is decidedly healthy, and instances of great longevity are not uncommon.

In the high latitude of Shetland, the light of day at midsummer never totally disappears, and the smallest print can be read at midnight, when the lingering rays of the preceding day mingle with and give way to the early dawn of the morrow. During winter the nights are proportionally long and dreary; and in the month of December the sun is not above the horizon more than five hours and twenty minutes.

Lerwick is the only town in Shetland, and the capital of the country. The houses having been originally built to accommodate the natives who resorted to Bressay Sound about two centuries ago, which was at that time annually frequented by foreign busses during the fishing season, are built close to the water-edge; and the country being destitute of roads and wheeled vehicles, streets were never thought of, and consequently the town presents a singularly confused appearance, with no other thoroughfare than a tortuous ill-paved path between the houses. It is however a bustling and interesting town, with a thriving and industrious population; possesses many excellent and well-supplied shops, and has one of the best harbours in Shetland, which should ultimately render Lerwick a town of considerable commercial importance. The population of the town, in 1831, was 2750. It stands on Bressay Sound, on the east side of the Mainland of Shetland: the harbour, which is about a mile wide at the south entrance, expands opposite to the town, and again contracts; being fully protected by the shores of Bressay Island on the one side, and by those of the Mainland on the other.

The history of Shetland is an interesting one, and is blended with that of Orkney. Antiquaries have long disputed whether the antient Romans saw the Shetland Isles when they circumnavigated Britain, and much learning has been advanced to connect the *Thule* of Tacitus (*Agricola*, c. 10) with Shetland. The prevailing belief now is, that *Thule* is a corruption of, or intended for, *Foula*, one of the Shetland Isles, and the only one of them which, from the altitude of its hills and its detached position, can be seen from the seas immediately to the north of Orkney.

In the ninth century Shetland and Orkney became subject to Norway; and the early history of the two provinces is preserved by Torfaeus, and confirmed by several other more antient documents. The country was peopled by Northmen, and their laws, language, usages, and manners were soon firmly established. About the year 1380 the former line of Norwegian earls ceased to retain their authority over the islands, and a Scottish nobleman, Henry Sinclair, obtained the earldom of Orkney, which included Shetland, from the king of Denmark and Norway, and it continued in his family for about a century under the sovereignty of Norway. In the year 1469 James III. of Scotland married Margaret, the daughter of Christiern, king of Denmark, and with her he was to get a dowry or marriage portion of 60,000 florins, of which it was agreed that 10,000 florins should then be paid, and that the Orkney Islands should remain mortgaged in possession of the Scottish king, until the remaining part of the marriage portion should be paid. The Danish king however only paid 2000 florins, and for the remaining 8000 he further mortgaged the Shetland Isles, which, along with Orkney (as no part of the money was ever paid), have been attached since that time to the kingdom of Scotland..

The Norwegian laws and usages however continued in full force in Shetland until a very recent period, together with several rules and customs arising from the detached and peculiar situation of Shetland, which were also respected as laws; and thus the old laws and observances of Shetland essentially differ from those of Scotland, and are interesting as exhibiting measures resorted to by a community remote from the operation of the general laws of the kingdom, in order to preserve the well-being of its society. The free property or possession of lands was known by the term *Udal*, the proprietors being termed *Udallers*, and this property descended in the udaller's family without the evidence of any written instrument. The chief judge was called the Great Foude, or Lawman, and under him were local Foudes and certain officers named Rancelmen, and a Law-rightman to regulate weights and measures. These Rancelmen, in addition to the duties belonging to the police courts of large towns in the present day, exercised several inquisitorial functions, such as inquiring into the domestic conduct of parents, children, and servants; the preventing of domestic quarrels and scolding, fining persons who neglected to attend church on Sabbath days; examining into the sufficiency of the work of tradesmen, and the preventing of tenants from injuring their lands or houses.

Shetland for the first time enjoyed the privilege of joining in returning a member to the imperial parliament in the year 1832, in consequence of the passing of the Reform Act for Scotland. Prior to this period Shetland was totally unrepresented in parliament; but now Orkney and Shetland, as a united county, return one member. Other important changes of a public nature are yearly tending to open the resources and to increase the prosperity of this remote portion of the empire. During the last four or five years a suitable steam-vessel has plied regularly every week, from March till November, between Edinburgh and Lerwick in Shetland, calling on her way at Aberdeen and Wick.

At an early period Shetland was called Hialtland and Yealtland, which afterwards became charged into Yetland and Zetland; and from this last name the late Lord Dundas, one of the leading proprietors in Orkney and Shetland, took the title of Earl of Zetland in 1838, when elevated to that rank in the peerage.

There are several interesting remains of antiquity in Shetland,—such as Lawtings, or open courts of justice under the Norwegian laws; round Pictish towers, particularly that of Mousa, which is nearly entire; and, of more recent erection, the ruins of the large castle of Scalloway.

Edmonston's *View of Zetland;* Hibbert's *Description of the Shetland Islands;* Sheriff's *General View of the Agriculture of Shetland; Various MS. Notes and Private Information.* (*Communication from Scotland.*)

SHEW-BREAD (לֶחֶם הַפָּנִים, *ἄρτοι ἐνώπιοι, ἄρτοι τοῦ προσώπου, τῆς προθέσεως, τῆς προσφορᾶς*) was the name given to the twelve loaves of bread, one for each of the tribes of Israel, which were constantly displayed on a golden table in the holy place of the Tabernacle and Temple. They were made of the finest wheat flour without leaven, and laid on the table in two similar heaps or rows, with frankincense and salt put over them. Every Sabbath they were renewed, and the old loaves were eaten by the priests in the holy place. The frankincense which was placed upon the shew-bread constituted it one of the 'offerings made by fire to the Lord.' The golden table on which they were placed was called the table of shew-bread. Wine was also placed upon it, and it was furnished with gold dishes, bowls, and spoons. (*Exod.*, xxv. 30; xxxv. 13; xxxix. 36; *Levit.*, xxiv. 5-9; *Numb.*, iv. 7; 1 *Sam.*, xxi. 6; 2 *Macc.*, i. 8; *Heb.*, ix. 2.) Further particulars will be found in Calmet's *Dictionary;* Lightfoot's *Prospect of the Temple;* and Winer's *Biblisches Realwörterbuch*, arts. 'Schaubrode' and 'Schaubrodtisch.'

The shew-bread is one of the most difficult parts of the Jewish Temple-service to explain. The common interpretation is, that as all the Jewish representations of divine things are strongly marked by anthropomorphism, the Temple being called the house of God, the most holy place his abode, the cover of the ark his throne, the altar his table, the burnt offerings upon it his meat (*Malachi*, i. 12), with which meat too a drink-offering was presented, so the shew-bread was, symbolically, his food. Perhaps the constant offering of the twelve loaves might be intended to signify the continual devotion of the substance of the twelve tribes to the service of God. But still the analogy of the rest of the Temple-service would lead us to conclude that some deeper typical meaning lies concealed under this rite, and, as every part of the Jewish ritual system is typical of some Christian truth or ordinance, perhaps there may have been in the shew-bread a reference to the sacrament of the Lord's Supper.

(Calmet, Lightfoot, and Winer, as above; Jahn's *Archäol. Bibl.;* Jennings's *Jewish Antiquities.*)

SHIELD was a part of the antient armour designed to ward off the strokes of the sword and all kinds of missiles. Shields were borne on the left arm, and were of different forms and sizes, and they were accordingly designated by different names. The large circular or oval shield, the invention of which was ascribed to Prœtus and Acrisius of Argos was called in Latin clipeus, and in Greek aspis or sacos (*ἀσπὶς* or *σάκος*). A smaller kind of round shield was called parma; and a smaller kind of oval shield was called pelta. Scutum was properly speaking a square or oblong shield. The antient writers however do not always accurately distinguish these different shields, but apply the name which properly denotes a particular kind of shield to shields in general. The shields in the earliest times were made of osiers twisted together (*γέῤῥα*), or of wood, and this framework was covered with the skins of oxen, of which there were mostly several layers, one over the other, whence Homer frequently calls the shield 'seven-hided' (*ἑπταβόειος*): Xenophon (*Anab.*, i., 8) describes the Egyptians, even of his time, as using wooden shields. The whole rim was surrounded with a metal edge. In the centre of the outer or convex side there was a projection called the ómphalos, *ὀμφάλος*, or umbo, in which sometimes a spike was placed, which served as a weapon of attack against an enemy who approached too near. The object of the umbo however was to make the missiles glance off from the shield. In the inner or concave side there was a band of metal or leather, which went from rim to rim as a diameter, and under which the arm of the soldier was placed, so that the shield hung on the arm. Around the inner edge there was a number of small thongs, by means of which the shield was managed with the hand. The shields of distinguished persons, even as early as the time of Homer, were covered with metal plates, and frequently adorned with embossed figures. These figures were often of the most exquisite workmanship, as may be inferred from the imaginary descriptions of the magnificent shields of Achilles, Hercules, and Æneas, in Homer, Hesiod, and Virgil. The shields of individuals, as well as of whole divisions of an army, had sometimes particular devices relating to memorable events in their history, and these are generally supposed to be the first traces of the armorial bearings of more modern times. The size of shields varied from two to four feet in length, and they were generally two or two and a half feet in breadth; so that a soldier with a large shield, by stooping a little, might conceal himself behind it, and thus be perfectly protected. The shields of horsemen were generally smaller than those of the foot soldiers. The use of shields continued from antient times throughout the middle ages, until they were made useless by the introduction of fire-arms. The numerous specimens of shields show that the knights of the middle ages were no less fond of adorning them with embossed figures, precious stones, &c. than the antients. [ARMOUR.]

There is an interesting work on the armorial bearings of the ancients, Bernd, 'Das Wappenwesen der Griechen und Römer,' Bonn, 1841.

SHIELD, WILLIAM, the popular dramatic composer, was born at Smalwell, county of Durham, in 1749. When very young, having lost his father, who was a teacher of singing, the circumstances of his mother rendered it necessary that he should adopt some business as a future means of subsistence, and having had the choice of three trades offered him, he fixed on that of a boat-builder, and was apprenticed at North Shields. His master, a kind-hearted indulgent man, rather encouraged than checked him in the pursuit of music at his leisure moments, and not unfrequently assisted him in rendering his talent as a violinist profitable, by permitting him to perform at the concerts in the town and neighbourhood. At the expiration of his apprenticeship he devoted himself wholly to his favourite art, and having attracted the notice of Avison, the author of the 'Essay on Musical Expression,' obtained from that able master instructions in the principles of composition, and shortly after exhibited the fruits of these, as well as of his own zeal and indefatigable industry, by composing an anthem for the consecration of the new church at Sunderland, which was most successfully performed by the choir of Durham cathedral. This led to his being invited to the tables of the dignitaries of the latter rich church, an introduction which, combined with his ability and excellent conduct, speedily placed him on the high road to fame and preferment.

He now undertook the management of the fashionable concerts at Scarborough, where, becoming acquainted with the charming pastoral poet John Cunningham, then an actor in the Scarborough company, he set several of his songs to music, and thus made himself very generally known as a melodist. He soon directed his views to the metropolis, and arriving in London with good recommendations, was immediately engaged by Signor Giardini as one of the band of the King's theatre, in which he soon became principal viola, an appointment which, suiting his taste, he retained nearly twenty years.

Mr. Shield first made himself known to the public as a dramatic composer in 1778, by 'The Flitch of Bacon'—written by a gentleman who had contrived to make himself very conspicuous, the Rev. H. Bate, afterwards Sir H. Bate Dudley—which was performed with the most marked success at Covent Garden. Soon after he entered into an engagement at the same theatre as composer and musical manager. In 1783 appeared 'Rosina,' written by Mrs. Brook, which is almost universally considered as Shield's *chef-d'œuvre*, and is still listened to with as much delight as when, in addition to its intrinsic merits, it had the recommendation of novelty. The same year was produced 'The Poor Soldier,' the drama by O'Keefe, which as a melodious opera is only second to 'Rosina.' 'Robin Hood' and 'Fontainebleau' followed shortly after; 'Marian,' 'Oscar and Malvina,' 'The Woodman,' and others succeeded, and ably supported the reputation which the composer had gained. In 1791, Mr. Shield, in company with his eccentric friend Joseph Ritson, went to Paris, and then extending his continental journey, visited the chief cities of Italy, including Rome, bringing home with him valuable materials for the theoretical works which he published a few years after his return. He then renewed his labours at Covent Garden, and produced 'Hartford Bridge,' 'The Farmer,' and many other operas, nearly all of which were more or less successful. In 1807 he finally retired from all theatrical concerns, and prepared his 'Introduction to Harmony,' a most valuable work in two quarto volumes, for publication. In 1809 he printed a volume of glees, ballads, &c., under the title of 'A Cento.' In 1817 appeared a second edition of his work on harmony, and also his 'Rudiments of Thorough-Bass.'

In the same year, on the death of Sir William Parsons, the Prince Regent appointed Mr. Shield to the situation of Master of the Band of Musicians in ordinary to the king, in which capacity he conducted the musical part of the ceremonial in Westminster Abbey at the coronation of George IV. He died in 1829, and his remains were honoured by interment in the cloisters of Westminster Abbey.

SHIELDS, NORTH. [TYNEMOUTH.]

SHIELDS, SOUTH, a parliamentary borough in the county of Durham, created by the Reform Act, and consisting of the previously existing townships of South Shields and Westoe in the parish of Jarrow. South Shields is on the south bank of the Tyne, at its mouth, 278¼ miles from London, by Barnet, Biggleswade, Norman Cross, Stamford, Newark, Doncaster, Boroughbridge, Northallerton, Darlington, Durham, and Monk Wearmouth.

Jarrow was eminent in antient times for its Benedictine monastery, of which some remains still exist: it was destroyed in the devastating invasion of William the Conqueror; but was subsequently repaired, and united with the abbey of Wearmouth; at last it became a cell to Durham. Its revenues at the dissolution were 40*l.* 7*s.* 8*d.* gross, or 38*l.* 14*s.* 4*d.* clear. The present church of Jarrow embodies some portions of the antient conventual church; a chair is preserved in the vestry, which is said to have been the seat of the venerable Bede, who was educated in the monastery of Jarrow, and spent a great part of his life there.

South Shields (antiently written Le Sheeles) has risen into importance with the extension of the coal-trade in modern times. One inscription which has been dug up indicates that the Romans had a station here, at the termination of the military road since called the Wreken Dyke; and various Roman antiquities have been found. The present town originated with the fishermen of the Tyne, who built here along the shore sheds, locally termed 'sheels' or 'shields,' to defend themselves from the weather. Subsequently (during the fifteenth and two following centuries) the place became known for its salt-works; nearly 150 pans were at one time employed, but that branch of industry is now nearly extinct. A number of artificial hills have been formed by cinders from the salt-works, the refuse of the glass-houses and the ballast discharged by the colliers, and some of these hills have been built upon.

The town of South Shields extends into the township of Westoe: the old part consists of a long narrow and inconvenient street running parallel to the river; but the more modern parts are better built and contain many good houses. In a large square near the centre of the town is the town-hall, used also as an Exchange and news-room, and having a market-house beneath. There is a chapel of great antiquity, but so much altered that little of the antient part can be traced, with the exception of the old tower; there is a chapel-of-ease of modern erection, and there are many dissenting meeting-houses.

The two townships have an area of 1760 acres; and contained, in 1831, 3018 houses, inhabited by 4659 families, 176 houses uninhabited, and 27 building; with a population of 18,756. The principal trade of the town is in coal, of which a great quantity is brought down the river in keels, and shipped here: there are some coal-pits in the immediate vicinity. Ship-building is carried on with great activity; during the last general war several frigates were built; and there were ten years since (*Parliamentary Boundary Reports*) docks in which nineteen vessels at once could be docked and repaired: there were very extensive glass-works, a pottery, and manufactures of soda and alum, breweries, and rope-walks. The original life-boat was built at South Shields by subscription. The market is on Wednesday; and here are two fairs, but they are indifferently attended.

There are a subscription library; a literary, scientific, and mechanics' institution; and a theatre. The two townships had, in 1833, two day and Sunday 'national' schools, one with 90 boys and 50 girls, and the other with 473 children of both sexes; 54 other day-schools, with 1893 children of both sexes; and 11 Sunday-schools, with 1226 children.

The living of South Shields is a perpetual curacy, in the gift of the dean and chapter of Durham, of the clear yearly value of 330*l.* It is in the archdeaconry and diocese of Durham.

South Shields has, since the Reform Act, returned one member to parliament. The number of qualified electors on the register in 1835-6 was 625; in 1839-40, 686, all 10*l.* householders. South Shields is one of the polling-stations for the northern division of the county of Durham.

(Surtees's *History of Durham*; *Parliamentary Papers*.)

SHIFFNALL. [SHROPSHIRE.]

SHIFTING USES. [USES.]

SHIITES is the name of a sect of heretics among the Mohammedans. The word comes from *shiah*, 'a faction, party, or set of men who separate themselves from the rest of the community,' and who entertain religious opinions contrary to those of the *Sunnites*, or people who belong to any of the four orthodox sects of Mohammedanism. The name of *Shiites* is principally used to designate the sectaries or adherents of Ali Ibn Abi Tálib, who maintain him to be the lawful khalif and imám, and say that supreme authority, both in spiritual and temporal matters, belongs to his descendants.

The Shiites are divided into numerous sects, of which the principal are:—the *Imámians*, or those who believe that the office of imám, or head of the church, is not dependent on the will of the people, and that religion consists solely in knowing who is the true imám; the *Zeydians*, so called from the name of their founder, Zeyd, son of Ali, surnamed Zeynu-l-abadín (the ornament of the servants of God); the *Khattabians*, or disciples of Abú-l-Khattáb, who maintain that paradise is no other thing than the pleasures of this world, which God grants to those with whom he is pleased; hence their indulgence in wine, music, and other things forbidden by the prophet. Many of the Shiites, like the *Gholaytes*, the *Nosayrians*, the *Ishakians*, carried their veneration for Ali and his descendants so far, that they attributed divine properties to them. The Persians are Shiites, and the Turks Sunnites; hence the cause of the schism still subsisting between them, which has been maintained on both sides with ardent zeal and implacable hatred. Though the difference arose at first out of political motives, it has since so much increased, that both parties detest and anathematize the other as heretics. The chief points wherein they differ may be reduced to three:—1, The Shiites reject Abú Bekr, Omar, and Othmán, the three first khalifs, as usurpers and intruders; whereas the Sunnites respect them as rightful imáms. 2, The Shiites prefer Ali to Mohammed, or at least look upon him as his equal in every respect; whilst the Sunnites admit neither Ali nor even any of the prophets to be equal to Mohammed. 3, The Sunnites receive the *Sunna*, or body of traditions concerning the prophet, as of canonical authority; the Shiites reject it as apocryphal and unworthy of credit. (Sale's *Preliminary Discourse*; Pococke's *Spec. Hist. Arab.*, p. 267.)

SHIP. The ships of war employed at first by the maritime nations of modern Europe were galleys, moved either by wind or oars, and were similar, probably, to those of the Greeks and Romans. In the beginning of the fifteenth century vessels of a like kind, but of greater dimensions, constituted portions of the navies of France and Spain; they were called Carraques, and it is said by a French author of that age that the English ships scarcely dared to approach them. The term Galeasse was afterwards applied to a kind of war-galley which was of greater length in proportion to its breadth than those generally constructed; its rowers were covered by a narrow deck running along each side of the vessel, and on this small cannon were mounted. Such were the vessels used by the Venetians at the battle of Lepanto.

Before the reign of Henry VII. the naval force of this country consisted only of the vessels furnished at short notices by the Cinque-ports, besides such as were hired from English or foreign merchants; and, according to Du Bellay, some of the ships were a sort of long galleys called Ramberges, in the management of which the English mariners are said to have been very expert. Henry VII. caused to be constructed the 'Great Harry,' the first ship which can be ranked as one belonging to the royal navy of England; and his successor, in 1515, in emulation of Francis I., who had built a ship called the 'Caracon,' carrying 100 guns, caused one of equal burthen (about 1000 tons), and carrying 122 guns, to be constructed. This was called the 'Henry Grace de Dieu.' It appears to have been built rather for magnificence than use; not more than thirteen of the guns were nine-pounders or upwards, and its construction must have been very defective, for it is said to have steered badly and to have rolled incessantly. After having made one voyage, it was disarmed at Bristol and suffered to decay. The French ship was equally unfortunate, having been accidentally destroyed by fire at Hâvre. Henry VIII. exerted himself however to place the maritime force of the nation in a train for being improved; for which purpose he organised the Admiralty and Navy Boards, and formed dock-yards at Deptford, Woolwich, and Portsmouth.

During the reign of Edward VI. and Elizabeth the royal navy became very powerful, and at the death of the queen it consisted of forty-two ships of war. In the time of James I. was built (1610) a ship called the 'Prince,' carrying 64 guns, and of 1400 tons burthen, being the largest which had been till then constructed. And before the civil war broke out Charles I. caused to be built one called the 'Sovereign of the Seas,' which carried above 106 guns, small and great; her length was 128 feet, and her breadth 48 feet.

The ships of that age, foreign as well as English, were constructed with hulls extravagantly high, while the lower guns were frequently not more than three feet above the water; they were consequently very liable to ship seas at the lower ports during an action, when the waves ran high, or the ship heeled considerably. But the rivalry between England and the United Provinces in the seventeenth century, and the desire which Louis XIV. entertained to raise the navy of France to an equality with those of his neighbours, led to the construction of ships capable of carrying artillery of much greater calibre than had before been used at sea. The French king actually caused to be built at Toulon a ship called the 'Royal Louis,' which carried 12, 24, and 48 pounders on its upper, middle, and lower decks respectively. In the same age, and during the eighteenth century, naval architecture was zealously studied in France; and the English constructors were so sensible of their inferiority, that in most of the ships built in England at that time the proportions were copied from those of ships which had been taken in action from the rival nation. Thus the 'Leviathan' was built at Chatham nearly in conformity to the 'Courageux,' a French 74-gun ship; and several others according to the construction of the 'Invincible,' which had been taken by Lord Anson during the Seven Years' war.

During the seventeenth century the custom continued of giving to the sterns a great elevation above the surface of the water, and of loading that part, as well as the bows, with ornaments. The sterns of ships of war were, till about twenty-five years since, made, at their junctions with the sides, of an angular form, or, as they were called, square; and before 1729 they had projecting galleries or balconies extending across them, and to some distance along each after-quarter of the ship. The galleries were afterwards much diminished in breadth, but it was not till 1796 that, by the influence of lord Spencer, who was then the first lord of the admiralty, these as well as the great projecting heads were entirely omitted in the construction of ships. In 1816 Sir Robert Seppings proposed to make the sterns curvilinear like the bows, but more flat; and by the adoption of his plan there was gained considerable strength, such a form enabling the ship to resist with great effect the force of a sea in striking the stern, and that of shot when fired against it. With respect also to the means of defence at the stern and quarters of a ship, it may be observed that the curvilinear stern has greatly the advantage over those of an angular construction, there being in the latter case an interval opposite each quarter of the ship towards which none of the after-guns can be brought to bear, while such interval does not exist in the former. In a ship with a curvilinear stern, the ports may be disposed so as to allow guns to fire in any direction diverging from a centre within the ship; and at the same time the after broadside guns may be trained so as to fire obliquely towards the fore or after part of the ship. Thus there will be afforded several intervals opposite the stern and quarters, within which the lines of fire may cross each other; and consequently the defence will be as powerful about the stern as at any other part of the ship. It may be added that when the guns in a square stern are trained at their greatest degree of obliquity to the sides of the ship, their muzzles will be considerably within the timbers; and consequently, in firing, some danger may exist of blowing away part of the stern or quarter. The curvilinear form is now, with slight modifications, generally adopted for ships of war; and the only objection hitherto made to it is that the interior accommodations are thereby rather diminished.

In 1791 there was formed in London a Society for the Improvement of Naval Architecture; and its first steps consisted in offering prizes for the best papers which should be written on the subject of the resistance of fluids, on designs for vessels, on the proportions of masts, &c. The Association has already done much in throwing light on the art of constructing ships; and both the theory and practice of that art have been advanced by means of the school which was attached to the Naval College at Portsmouth, in 1811, under the superintendence of Dr. Inman. In this school young men are now instructed in those branches of science which have relation to naval affairs, and are also made to perform with their hands the mechanical operations which are required in building a ship.

In the present article it is intended to give some account of the mathematical principles only of naval architecture; the mechanical construction of ships being reserved for the article SHIPBUILDING.

The body of a ship about its middle has nearly the form of a portion of a hollow cylinder, with its axis horizontal, and its convex surface downwards. Above the surface of the water on which it floats the sides are curved, so as at the head to have, in a horizontal direction, the form of a Gothic arch more or less acute. The breadth diminishes gradually towards the stern, which above water is either a plane surface nearly perpendicular to the ship's length, or, agreeably to the construction introduced by Sir Robert Seppings, curved so as to have, in a horizontal section, nearly the form of a semi-ellipse. Below the surface of the water the body of the ship is curved in a horizontal direction towards the head and stern, so as to terminate at those places in angles which diminish from that surface downwards; and thus a vertical section, taken perpendicularly to the length of the ship, at some distance from the middle towards either extremity, presents on each side the form of a curve of contrary flexure.

The most essential conditions in the construction of a ship are, that it be capable of carrying its stores and its artillery or lading: that it be moved by wind or steam with great velocity, and that it readily obey the motion of the rudder; that it have the necessary stability, so as not to be overturned when acted upon by the wind or waves; and, finally, that its rolling or pitching be attended with as little strain as possible on the timbers. A contemplation of the qualities which a ship ought to possess, in order that it may fulfil the objects proposed by it, cannot fail to cause its construction to be considered as one of the most difficult problems in mechanical science. Those qualities are in some respects contrary to each other; and the degree of attainment for each will depend in part on the purpose, whether of war or commerce, for which the ship is built. The skill of the architect lies therefore in finding such a construction as shall allow the quality most required to be obtained in the highest degree, without being attended by too great a sacrifice of the others. The form indicated above has by experience been found to afford the means of uniting the different conditions, as far as they are consistent with each other; but that form is capable of being varied within very distant limits. The subject of the resistance of fluids against bodies immersed in them is also so imperfectly known, that the most proper proportions which the several dimensions should have to each other, in order that such resistance may be as little as possible, are yet to be determined; and in the present state of science, those proportions can only be obtained from the dimensions of ships of different classes which have been observed to possess the best sailing properties.

In merchant ships an ample capacity is frequently of more importance than a great velocity in sailing; and in this case the relations between the length, breadth, and depth depend less upon hydrodynamical principles than the corresponding relations in ships of war. With respect to the latter, it is observed by Mr. Morgan, in his papers on naval architecture, that the number and weight of the guns constitute the basis of the design; for from these the weight of the whole ship, or the volume of the water which it will displace, may be estimated. The distance between the guns on the decks must be such as by experience has been found sufficient for working them; and hence the number of decks being given, the least length which the ship should have becomes known. The breadth also must in part be determined by the artillery; for on each side of the ship, between the hatches or ladder-ways and the rear of the gun-carriages after the recoil, there must be room for a free passage; but this element must also be great enough to afford the necessary stability, that the tendency of a lateral wind to turn the ship about a longitudinal axis may be resisted. The draught of water (the depth to which the ship is immersed) may depend on the depth of water in the harbours and roadsteds; but it should also be determined from experience, so that the ship may be prevented as much as possible from making leeway; and the height of the ship above water must be such that, while the upper tiers of guns are kept as low as possible, the height of the lowest tier above the water, when the ship floats upright, may be not less than six feet, in order that the lower guns may be worked when the ship has considerable inclination. Finally, the form of the body must be that which is most favourable for velocity, by causing the least possible resistance of the water at the bows and along the sides; which allows the greatest lateral resistance, and which will permit the rudder to act with most effect in causing the ship to be turned about a vertical axis. And if, when in the design for a ship all these conditions are fulfilled, the displacement (weight of the volume of water which would fill the space occupied by the ship below the general surface of the water in which she floats) is equal to the whole weight of the ship, the several dimensions may be considered as nearly correct. Ships carrying 44 and 64 guns on two decks, and 80 guns on three decks, are now no longer constructed, because the proportions between the lengths and breadths which depend on those numbers of guns produced vessels having deficient sailing qualities.

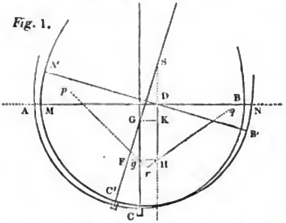
Experiments have shown, that when the quantity of sail is the same, the velocity of a ship is increased by increasing the ratio between its length and breadth, and both English and French constructors have gone on for many years augmenting that ratio; but this increase has its limit, which however has not as yet been ascertained. The advantage of diminished breadth is accompanied by an inferiority of stability, and a deficiency in this respect may produce serious evils. It may prevent the use of the lower guns on the leeside from the fear that the ports may be under water, and the use of the guns on the weather-side from inability to give them sufficient depression; and by causing the keel to take an oblique position in the direction of its depth, the lateral resistance of the water being diminished, the leeway of the ship is increased. The power of the rudder and sails to produce rotation about a vertical axis is greater in a long than in a short ship, because the rudder and sails are at greater distances from that axis, and because the impulse of the water on the rudder is more direct: yet the resistance which the water opposes to that rotation increases in a still higher ratio; and thus the difficulty of working to windward is increased with the length of the ship. Lastly, the quantity of artillery in a ship will indirectly affect the relation between the length and breadth; for an increase of weight above water produces a diminution of stability by causing the centre of gravity of the ship to be more elevated, and this evil must be counteracted by increasing the breadth. In several English ships of war carrying from 46 to 120 guns it has been found by admeasurement that the ratio of the breadth to the length varied from $\frac{1}{3\cdot93}$ to $\frac{1}{3\cdot61}$, and that it had no dependence either upon the number of guns or upon the tonnage of the ship. The greatest length which may be given to ships of war is a point still undetermined; and the length seems to have hitherto gone on increasing in the navies of all nations. In 1786 was built the Victory, of 100 guns; this was then the greatest three-decker in the British service, and its length was 186 feet. In 1796 the Ville de Paris, of 110 guns, and 190 feet long, was built at Chatham; and in 1809 was built the Caledonia, of 120 guns, whose length was 205 feet. Some of the American line-of-battle ships with two decks are said to be about 206 feet long, and to mount 102 guns.

In the Vernon, and other ships which have been built according to the designs of Sir William Symonds, the present surveyor-general of the navy, the form of a transverse section passing vertically through the hull differs from that which had been before given to ships, in exhibiting an increase of breadth above the plane of floatation (a horizontal plane passing through the ship when she floats upright, and coinciding with the surface of the water). This construction produces, without any diminution of velocity, an increase of stability not only when the ship is afloat, but also when, on lying aground, she is subject to the force of waves against her side. It may however be said to be attended by the disadvantages of too great stability; that is, it may cause the ship to be considerably strained, and the masts to be carried away by a sudden impulse of the wind.

Archimedes showed that the stability of a body floating in a fluid depends on an equilibrium between the weight of the body and the reaction of the fluid; and Euler ('Scientia Navalis,' 1749), from considerations purely mathematical, investigated the circumstances in which floating bodies of different forms would be in equilibrio. But Bouguer ('Traité du Navire,' 1746) was the first who combined theory and practice in his investigations respecting the stability of vessels; and nearly every author who has since treated the subject, even Euler himself, in his elementary treatise on the construction and movements of vessels (1772), has adopted the principles which he had established. Don George Juan published at Madrid, in 1771, under the title 'Examen Maritimo,' a learned treatise on the construction of ships; and in 1775 M. Chapman (afterwards Admiral), a mathematician and naval architect to the king of Sweden, published on the same subject, and in the language of that country, a valuable work, which was translated into French by Vial de Clairbois, who was also the author of an 'Essai sur l'Architecture Navale' (1776), and into English, with notes, by Dr. Inman, the professor at the Royal Naval College. The work of Chapman on the construction of ships of war has also been translated by Messrs. Morgan and Bennett. To these must be added the papers on the stability of ships, in the 'Philosophical Transactions,' by Mr Attwood, M. Dupin, and Dr. Young.

The lateral action of the wind against the sails, and of the waves of the sea against the hull of a ship, are the causes that the plane passing through its masts is made to decline from the vertical position which it has when the ship is at rest; and the ship is then prevented from being overturned only by the reaction of the water against the bottom and sides. The momentum of this reaction is that which is called the stability of the ship. The axis of the rotation has been placed by different writers in different situations, but both Bouguer and Euler have proved that, if the ship has not at the same time a pitching motion, it should be considered as a horizontal line passing through the centre of gravity of the ship. In order to find approximatively the dependence of a ship's stability on its length and breadth, let it be supposed that the ship is a homogeneous solid in the form of a prism or segment of a cylinder having its axis in a horizontal position; and, the vessel being supposed to float upright, let ABC (*Fig*. 1) be a transverse section through the immersed part in a vertical plane passing through G and *g*, which are respectively the centres of gravity of the whole solid and of that part (AB) coinciding with the surface of the water: let also A′B′C′ be the position of the same section when the vessel is inclined. Now, while the weight of the ship remains the same, the volume of the immersed part is the same whether the ship be upright or inclined, and the volume raised above the water by the inclination on one side is equal to the volume depressed below it on the other; therefore the area MC′N may be considered as equal to ACB, and A′DM to B′DN. Next let *p* and *q* be the centres of gravity of the trilateral spaces last mentioned; then, by mechanics, the centre of gravity of MDB′C′ will be at some point, as *r* in *pg* produced, the displacement of *g* by the inclination being supposed to be very small; and the centre of gravity of MC′N

Fig. 1.



(the section immersed when the solid is inclined) will be at some point H in *qr*: also—

A′B′C′ : A′DM : : *pr* : *gr*, and
MC′N (=A′B′C′) : B′DN (=A′DM) : : *qr* : *r*H.

Therefore *pr* and *qr* are cut proportionally in *g* and H; and *g*H is parallel to *pq*. Consequently—

pr : *gr* : : *pq* : *g*H,
or ABC : A′DM : : *pq* : *g*H;

and if the inclination of the ship is very small, *g*H may be considered as parallel to AB. Draw the vertical line HS, and GK parallel to AB; then *g*H=GK.

The area ABC may represent the volume (V) of the displacement, or of the immersed part of the ship; and the area A′DM, the volume raised above or depressed below AD in consequence of the inclination. This trilinear space being supposed to be very small, it may be considered as a triangle right-angled at M; and if the length and half-breadth of the solid be represented by *l* and *b* respectively, we have $\frac{1}{2}$A′M.*l*.*b* for the representation of the elevated or depressed volume. But A′M varies with *b*; therefore such volume varies with $l.b^2$. Again, by mechanics, the distance of the centre of gravity of each of those volumes from a horizontal line passing through D, in a direction parallel to the axis of the solid, is equal to $\frac{2}{3}b$; therefore the line $pq = \frac{4}{3}b$, or *pq* varies with *b*. Then substituting, in the last proportion above, V for ABC, $l.b^2$ for A′DM, and *b* for *pq*; also putting GK for *g*H, we find that GK varies with $\frac{l.b^3}{\text{V}}$; or $\text{V.GK} \propto l.b^3$. Now the force of the water to prevent the ship from being overturned taking place, by hydrostatics, in the vertical line HS passing through H, and being represented by V; also the ship being supposed to turn about a longitudinal axis passing through G, we have V.GK for the momentum of the ship's stability; but the triangle GKS is similar to A′MD, all the sides of one being perpendicular to those of the other; therefore

A′M : DM : : GK : GS.

Again A′M varies with DM; therefore GK varies with GS, and $\text{V.GS} \propto l.b^3$; that is V.GS expresses also the momentum of the ship's stability. The point S is called the metacentre, and it indicates the most elevated position which the centre of gravity G can have consistently with the stability; for when G coincides with S, it is evident that the above expression vanishes.

Since the depth of the ship does not enter into the expression $l.b^3$, it may be inferred that when ships have equal lengths and breadths, they will have equal stabilities, whatever be their depths. Again, when they have equal breadths, their stabilities will vary with their lengths; and when they have equal lengths, the stabilities vary with the cubes of their breadths. It follows also that, in general, the stability of a ship is directly proportional to its length and to the cube of its breadth, whatever be its depth.

In the next place, in order to find approximatively the relations between the velocity of a ship and its dimensions, let the ship be represented by an isosceles triangular prism having the greatest rectangular surface uppermost and parallel to the surface of the water, and the triangular ends perpendicular to that surface, so that the fore and after parts are rectangular planes inclined to the same surface; then for the present purpose we may assume that the resistance experienced in moving through the water is expressed by $v^2 \text{A} \sin^2 \text{I}$. [HYDRODYNAMICS], where *v* is the velocity of the vessel, A the superficies of the inclined front, and I its inclination to the surface of the water. But the resistance of the water is directly proportional to the moving power, that is, to the pressure of the wind on the sails, and this last varies with the area of the sails, which may be represented by *a*: therefore $v^2 \propto \frac{a}{\text{A}.\sin.^2 \text{I}}$. Again the momentum of the ship's stability is directly proportional to the momentum of the wind on the sails, and the latter is expressed by the product of the area of the sails into the height of the centre of pressure (centre of gravity of the sails) above the axis of rotation: now this height varies with the height of the sails; that is, with the square root of their area, the sails in different ships being supposed to be similar plane figures. Therefore the momentum of stability varies with $a^{\frac{3}{2}}$, or $a \propto$ (moment. of stability)$^{\frac{2}{3}}$. Let *l* be the half length of the vessel, *b* its breadth, and *d* its depth; then the momentum of stability as above may be represented by $l.b^3$, A will be equal to $b(l^2+d^2)^{\frac{1}{2}}$ and $\sin^2 \text{I}$ to $\frac{d^2}{(l^2+d^2)^{\frac{1}{2}}}$. Hence $v^2 \propto \frac{l^{\frac{2}{3}}b(l^2+d^2)}{d^2}$; and this being simplified, neglecting d^2, which may be considered as small when compared with l^2, we have $v \propto \frac{b^{\frac{1}{2}}l^{\frac{4}{3}}}{d}$.

This expression indicates that the velocity will be increased by diminishing *d*, which may represent the ship's draught, or the depth to which she is immersed. It is evident also that the like effect will take place if the length or the breadth, or both, are increased (the breadth of the sail being supposed to increase with that of the ship); and since, in this case, the stability will at the same time be increased, this will permit the ship to carry a greater quantity of sail; but the number of the crew being supposed to vary with the area of the sail, an increase of the latter is in general attended with a corresponding increase of expense. The factors in the value of *v* being different powers of *b*, *l*, and *d*, it thence follows that ships having the same proportions possess unequal sailing properties; it may be perceived indeed that a small ship built according to the proportions of a large one which is known to sail well will not possess the like good quality. On the other hand it may be inferred that a vessel having the same proportions as a good one of smaller dimensions will be superior to the latter. If two ships carry sails proportional to their stabilities, and if the height of the lower tier of guns above water be the same in both when the ships float upright; then, the inclinations of the planes of their masts being also supposed to be equal, the lower guns of the smaller ship will be farther from the water than those of the larger ship, and, in action, the latter might be in danger when the other would be safe. Consequently, if the greatest possible quantity of sail be given to the smaller ship, a smaller quantity relatively to its stability ought to be given to the larger.

That a ship whose hull has been constructed according to the best rules of art does not always fulfil the conditions required, may depend on several causes. The blocks, ropes, &c. may be too heavy, and the sails may be badly formed. If the burthen is placed too low, the rolling will be heavy, and the masts may be endangered; on the other hand, if the burthen is too high, there may not be sufficient stability. If the burthen is too near either of the extremities, the pitching motion will be violent, and the velocity will be consequently diminished. Lastly, through unskilfulness the sails may not be properly set with respect to the direction of the wind and of the ship's path, so that the force of the wind to propel the ship may be less than it would otherwise be, or the ship may be incapable of going about.

The discovery of the elements on which depend the stability and the sailing properties of ships will probably be made rather by studying the proportions of such as from experience have been found to possess the desired qualities, than by purely scientific researches; and as a step preparatory to this study it will be necessary to be acquainted with the methods by which, in a body like a ship, which cannot be considered as corresponding to any geometrical solid, the areas of sections, the volume of the whole or of the part immersed in the water, the position of the centre of gravity of the hull or the sails, &c., are found.

The method of equidistant ordinates is generally used for these purposes; and in finding the area of a section, some line in it being taken as an axis, an uneven number of lines as ordinates are drawn or supposed to be drawn at equal distances from one another perpendicularly to that line till they meet the surface of the ship. The lengths of these ordinates being known by actual admeasurement, or by the scale of the drawing, and also the distance between them; and the curve line in which the plane of the section meets the surface of the ship being considered, between every three consecutive ordinates, as an arc of the common parabola; by the rules of mensuration the required area will be expressed by the formula $(a+4s+2s'+b)\frac{d}{3}$; in which *a* and *b* are the two extreme ordinates; *s* is the sum of all the even ordinates, as the second, the fourth, &c.; *s'* the sum of all the uneven ordinates, the third, the fifth, &c.; and *d* is the constant distance between every two ordinates. The following more simple and equally accurate formula for approximating to the area of any curvilineal figure has been demonstrated by mathematicians; viz. $(\frac{1}{2}(a+b)+S)d$, where *a* and *b* are the two extreme ordinates, S is the sum of all the others, and *d* is the constant interval between them.

By either of these rules the area of a vertical section through the middle of the ship's breadth in a longitudinal direction, or through any part of the ship's length in a transverse direction, and also the area of a horizontal section coincident with or parallel to the surface of the water, may be found. The same formulæ may be applied to determine the volume of the whole hull or of the displacement; for this purpose vertical sections may be supposed to pass through the equidistant ordinates drawn perpendicularly to the longitudinal axis of the ship, and their areas to be computed as above; then, in the first formula above, *a* and *b* must represent the areas of the sections passing through the two extreme ordinates; *s* the sum of the areas of all the even sections; *s'* that of the areas of all the uneven sections; and *d* the common distance of the ordinates or sections. Or the volume may be found in like manner by means of the computed areas of an uneven number of equidistant horizontal sections supposed to pass through the ship; and if the two volumes of the parts on opposite sides of a vertical plane passing through the keel, when computed by the different methods, should be found to disagree with each other, the sum of the volumes may be considered as a nearly correct value of the whole. The formulæ may also be employed to determine the momentum of any part of the ship with respect to some line about which it may be made to turn, or with respect to a plane passing through such line; and in this case the terms of the first formula will denote the momenta of the areas of the sections parallel or perpendicular to the given line or plane, and *d* the distance between the sections as before.

In order to find the centre of gravity of the displacement, that is, of the immersed part of the ship (considered as a homogeneous solid) when the ship floats upright; imagine that immersed part to be divided by equidistant vertical planes perpendicular to the ship's length, and also by equidistant horizontal planes; then the area of each horizontal section between every two vertical planes being multiplied by the vertical distance of that horizontal section below the surface of the water, and all the products being added together by either of the above formulæ, the sum will be the momentum of the immersed part with respect to the horizontal plane at the surface of the water. This momentum being divided by the volume of the immersed part computed as above, gives by mechanics the distance of the centre of gravity below the surface of the water. In a similar manner may be found the position of the centre of gravity with respect to a vertical plane passing perpendicularly to the length of the ship, suppose at one of its extremities; and thus its position may be completely determined. From the symmetry of the ship's figure on each side of a plane passing through its masts and keel, the centre of gravity of the whole ship will always be in that plane; and that of the immersed part will be in the same plane when the ship floats upright.

The position of a vertical line passing through the centre of gravity of the whole ship may be found by determining that of a vertical line passing through the centre of gravity of the displacement; for, by hydrostatics, when the ship floats with its masts upright, these lines are coincident. But the determination of the place of the centre of gravity in this line is a problem of considerable difficulty on account of the complexity of the subject, arising from the form of the hull, the positions of the masts, rigging, guns, lading, &c.; and it can only be found mathematically by ascertaining the place of the centre of gravity and the weight of every separate object constituting the mass of the ship and its lading. The momenta of all these objects being computed with respect to any one plane, as that of floatation (the horizontal plane at the level of the water) the difference between the sums of the momenta of the objects above and below that plane is, by the nature of the centre of gravity, equal to the product of the weight of the whole ship into the distance of the required centre of gravity from the same plane. Hence the situation of this point might be found.

The most simple mechanical method of finding the centre of gravity of a ship is probably that which was proposed by Mr. Major in the *Annals of Philosophy*, June, 1826. It consists in making the ship when afloat heel (the plane of its masts to incline) through equal angles by means of weights applied successively to a mast, and made to act horizontally at different distances above the deck; these weights being reduced to directions perpendicular to the inclining mast (by multiplying them into the cosine of the inclination) and then multiplied into their respective distances from the unknown centre of gravity of the ship, will give two products which are equal to one another; each of them being equal to the momentum of the resistance by which the water tends to prevent heeling; hence by algebra the distance of the centre of gravity from either of the points at which the weights are applied may be found.

In the expression for the momentum arising from the pressure of the wind against the sails, it is usual to consider the whole force of the wind as acting at the centre of gravity of the sails; and this point may be found by multiplying separately the area of each sail into the distance of its centre of gravity above a horizontal axis passing through the centre of gravity of the ship. The quotient arising from the sum of these momenta divided by the sum of the areas of all the sails will give the distance of the required centre of gravity above that axis; and similarly the position of the centre of gravity of the sails with respect to any vertical line as an axis may be obtained.

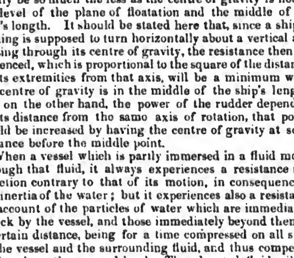
To find the centre of gravity of the displacement, or of the immersed part of the ship supposed to be homogeneous, when the plane of a ship's masts is made to incline by the lateral action of the wind, the axis of rotation being supposed to be a horizontal line passing through the centre of gravity of the whole ship, there must be first obtained by trial the position of a horizontal line in which the plane of the surface of the water will cut the body of the ship when in the upright and inclined positions respectively, so that the volume of the part raised above the water in consequence of the inclination may be equal to that of the part depressed. Let a line passing through D, *Fig.* 1, perpendicularly to the paper, be that horizontal line; then the sum of the momenta of the elevated and depressed volumes may be found by computing the areas of the trilineal figures A'DM, B'DN, in all the vertical sections taken at equal distances from one another in the direction of the ship's length, multiplying them separately by the distances of their centres of gravity from a vertical plane passing through the same horizontal line, and then adding all the products together by one of the formulæ above given. In the *Quarterly Journal of Science*, April, 1830, the area of either triangle, as A'DM, is expressed by $\frac{\gamma+\gamma''}{2}\gamma' \sin \frac{1}{2}\theta$, where γ=DM, γ''=DA', γ'= a line drawn from D to A'M, bisecting the angle A'DM, or θ (the angle of heeling). Also the momentum of the same triangle with respect to the point D is expressed approximatively, and supposing the angle of heeling to be 7° (the greatest at which a ship of war can use her windward guns), by $.0203\gamma\gamma''(\gamma+\gamma'')$.

In order to find an expression for the stability of a ship, let G be its centre of gravity, and when the ship floats upright let *g* be the centre of gravity of the immersed part supposed to be homogeneous. Now when the plane of the masts is inclined, *g* will be situated at F, and in that case let H be the place of the centre of gravity last mentioned; then by mechanics, FH will be equal to the quotient arising from the division of the sum of the momenta of the elevated and depressed volumes by the volume of the immersed part of the ship. But if θ be the angle of inclination, we shall have F*g*=GF sin θ; therefore *g*H or GK may be found. This being multiplied by the weight of the ship and its burthen (=the force of the reaction of the water in the direction HS), gives the expression for the stability.

The plane of a ship's masts is made to decline from a vertical position not only by the action of the wind against the sails when the direction of the wind does not coincide with that plane, but also by a wave striking the ship in a direction oblique to the horizon and to the plane of the masts; and in both cases the variations in the force by which the inclination is produced and the re-action by which the water tends to bring back the plane of the masts to a vertical position cause the ship to roll about some longitudinal axis, which is supposed to pass horizontally through the centre of gravity of the whole ship. Now, if a horizontal plane coincident with the plane of floatation pass through AB when the ship floats upright, and G, the centre of gravity of the ship, be below that plane, as in the figure; in order to preserve the equality of the immersed volume when the ship is inclined, the plane which passed through AB must take such a position as A′B′. This will cause G to ascend; that is, the ship will rise on the water. On the other hand, if G had been above AB when the ship was upright, the latter would descend on the water when it is made to take an inclined position. Such rising or descending is a cause of the ship being shook or strained in rolling; and this evil can be avoided only by having the centre of gravity G coincident with the plane of floatation. It is necessary to observe, on the other hand, that by keeping that centre higher, or bringing it nearer to the metacentre S, the stability of the ship, which varies directly with the distance GS or GK, is proportionally diminished. The pitching of a ship, that is, the alternate elevation or depression of either extremity of the ship as the latter passes over a wave, is attended by a corresponding rising or descending of the whole ship; and the strain thus produced will evidently be so much the less as the centre of gravity is nearer the level of the plane of floatation and the middle of the ship's length. It should be stated here that, since a ship in tacking is supposed to turn horizontally about a vertical axis passing through its centre of gravity, the resistance then experienced, which is proportional to the square of the distances of its extremities from that axis, will be a minimum when the centre of gravity is in the middle of the ship's length; but, on the other hand, the power of the rudder depending on its distance from the same axis of rotation, that power would be increased by having the centre of gravity at some distance before the middle point.

When a vessel which is partly immersed in a fluid moves through that fluid, it always experiences a resistance in a direction contrary to that of its motion, in consequence of the inertia of the water; but it experiences also a resistance on account of the particles of water which are immediately struck by the vessel, and those immediately beyond them to a certain distance, being for a time compressed on all sides by the vessel and the surrounding fluid, and thus compelled to rise above the general level. The elevated fluid will be highest before the middle point at the bows of the vessel; and the hydrostatical pressure arising from the elevation, combined with the reaction of the neighbouring fluid, will cause the particles to flow off laterally in the direction of some curve-line whose convexity is towards the vessel, after which they will mix with the fluid on each side. Now let ADB, *Fig.* 2, be a horizontal section through the ship at the general level of the water, and let CED be the space occupied by the confined water in front of the ship; then if an artificial prow of that acute form were given to the ship, the particles of water contiguous to the sides of such prow would create very little resistance in addition to that which arises from the inertia of the water, while the latter resistance will evidently be so much the greater as the bows are more obtuse. Beyond D and E the particles flowing along the side exert forces arising from friction, adhesion, and the lateral pressure of the neighbouring water; and at certain points, as F and G, they pass off in the directions of tangents at those points. The force of friction and adhesion is very considerable, particularly if the surface is rough and unequal; and if the vessel is moving with or against a current, the pressure against its sides is equal to that which would be experienced if the water were at rest, diminished or increased on any given area by the weight of a column of the fluid whose base is that area, and whose height is that which is due to the velocity of the water. It has been found moreover by experiment, that if both vessel and fluid are in motion, with equal velocities in the same direction, the buoyancy of the vessel is the same as if both were at rest; but when the velocity of the vessel is less or greater than that of the fluid in the same direction, the vessel either sinks or rises in the fluid by a quantity equal to the height due to the difference of the velocities, and this circumstance must in some measure modify the resistance of the water against the vessel.

Fig. 2.



Besides the resistance arising from the friction of the water along the sides of the vessel, there must be noticed the diminution of pressure against the after part, in consequence of the water displaced by the motion not falling in behind with sufficient velocity to bring the surface there to the same level as in front. The particles of water diverging from the sides of the vessel in oblique directions, as FH, are by the lateral resistance of the neighbouring fluid deflected so as to describe curve lines which finally unite behind the stern in some point, as L. But the force exerted to deflect the particles from the direction FH causes a diminution of the pressure which the water would have otherwise exerted against the after part of the vessel; and consequently it is to be considered as an additional power opposing the forward movement of the vessel. The force of deflection, and consequently the retardation, will evidently be less in proportion as the tangent FH is nearer to the side of the vessel, or as the point F is more distant from the stern; and this circumstance indicates the advantage which ships of considerable length have over others. It is easy to understand however from the breaking and foaming of the water at the head and stern of a vessel when moving with considerable velocity, that the effects of the resistances will be greatly modified by the collisions of the particles of water with each other, and with the surface of the vessel, in consequence of the shocks produced by its motion, and by the effort of the water to return to a state of equilibrium.

Vessels intended for rivers, where the surface of the water is always nearly level, may have their bows made very sharp, so as to experience comparatively little resistance to their motion; but this construction has its limits for ships which are to navigate the ocean, where the waves run high. When a ship, having considerable breadth of bows, meets a sea, the resistance which she opposes to it causes her to be raised, and to be borne upon the wave; whereas, if differently constructed, she would be carried through it. The yacht called the Fire-King is made extremely sharp, and with a very gentle curvature both at the bows and stern; she therefore cuts the water with great facility, and the displaced particles seem almost immediately to fall in towards the rudder, so that the diminution of pressure abaft is small, but being, from the want of a sufficient power of resistance, prevented from rising on the waves, her decks are said to be constantly deluged with water.

In order to obtain an expression for the resistance of the water against a ship, the part of the immersed surface which is before the greatest transverse vertical section is supposed to be divided by a number of such transverse sections at equal distances from one another, measured perpendicularly between them, and by a number of sections parallel to the plane of floatation at equal distances from one another vertically. Thus the surface of the immersed part in front of the greatest transverse section is divided into trapezoidal figures; and a like division of the immersed part of the ship's surface abaft of the greatest transverse section is made. Each trapezoid, in an orthogonal projection of the fore and after part of the ship made on a plane parallel to the greatest transverse section, is then divided into two triangles by a diagonal line, and the area of each projected triangle (found by admeasurement of its sides on the scale of the drawing) is multiplied into the resolved force of the water upon it; that resolved force being expressed by the absolute force multiplied into the square of the sine of the inclination of the triangle on the ship's surface to the direction of the motion. The sum of the products is taken for the whole resistance of the water against the ship. In comparing the resistance against one ship with the resistance against another, it is evident that the absolute force of the water on each may be represented by unity.

Experiments sufficiently prove that the resistance experienced by a body in moving through a fluid is less when the greatest breadth of the body is at some distance before the middle of its length, than when it is precisely at that place, but the most advantageous situation of what is called the *midship section* (the greatest vertical section taken perpendicularly to the length of the ship) is far from having been as yet determined. In order to find its dependence upon the direct resistance of the water, M. Chapman proceeds in the following manner:—He considers the ship to be represented by a solid in the form of two isosceles wedges joined together at their heads and to move in the water with the planes which are perpendicular to their edges parallel to its surface. Now it is evident that when the solid is at rest in still water, the opposite pressures of the water against the faces in front, and against those which are behind the plane of junction, or of the greatest transverse section, will be equal to one another in directions parallel to the length of the solid. Also that, when in motion, the front faces will experience directly that resistance of the water which is due to the velocity of the solid, and that the after faces, by receding from the water in consequence of the advance of the body, will lose a portion of the pressure which they would have experienced had the body been at rest, and which would thus have indirectly contributed to force the body forward. It must moreover be observed that the water is driven forward in front of the vessel with a velocity which may be represented by v'; and that as the water in front becomes higher than that which is behind the greatest transverse section, it will flow towards the stern with a velocity which may be represented by v''. Hence if A be the sum of the areas of the two oblique surfaces in front of that greatest section, and B that of the surfaces abaft of the same section; also if θ and θ' be the inclinations of those surfaces respectively to the line of motion, and v be the velocity of the body, we shall have, supposing the resistance to vary with the square of the velocity and the cube of the sine of the inclination,

$$\mathrm{A}\,(v-v')^2 \sin.^3\theta+\mathrm{B}\,(v+v'')^2 \sin.^3\theta'$$

for the value of the whole resistance; or, for A sin. θ and B sin. θ' putting their equal C (the area of the transverse section) the expression for the resistance becomes

$$\mathrm{C}\left\{(v-v')^2 \sin.^3\theta+(v+v'')^2 \sin.^3\theta'\right\}.$$

This formula indicates that such a body will always meet with less resistance when C is in front, than when it is abaft of the middle point in the length; that is, when θ is greater than θ': it indicates also that the place of the greatest breadth when the resistance is a minimum depends on the values of $v-v'$ and of $v+v''$, and that the greater v' and v'' are with respect to v, the farther should the greatest breadth be in front of the middle point.

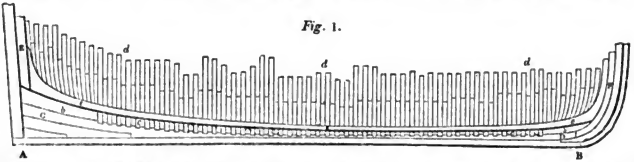
Imagining a horizontal section through a ship at the surface of the water to present the form of four portions of parabolas, the two in front of the greatest transverse section being similar and equal on opposite sides of the longitudinal axis; and likewise the two portions abaft of that section being similar and equal to one another, but different from the former portions, Chapman finds, as approximations to the place of that greatest section, that its distance in front of the middle of the ship's length may be four, six, or eight times the horizontal distance of the centre of gravity of the whole ship from that middle point. And his observation is that the first distance might serve for sharp vessels, as frigates, and the last for merchant ships, which are much broader than the others in proportion to their lengths. Colonel Beaufoy's experiments with solids of various forms indicate that, in general, the distance of the midship section in front of the middle point in the length should be one-tenth of the length.

It must be understood that the assumptions on which the formulæ expressing the relations between the principal dimensions of ships, and between the dimensions and velocity, have been investigated, are far from being conformable to the circumstances of a ship when moving through the water, and the same may be said of the above process for finding the place of the greatest transverse section; consequently, the formulæ afford but remote approximations to the rules which should guide the naval architect in the formation of a design. A far more perfect knowledge than we have at present of the action of the wind on the sails, of the resistance of the water, and of the conditions of stability in a ship, will be necessary before the results of analysis will be capable of being applied directly to the details of construction.

SHIP-BUILDING. When a ship is to be constructed, drawings representing the necessary elevations and sections, generally on a scale of a quarter of an inch to a foot, are prepared, and copies of these, enlarged to the full size of the objects which they represent in the intended ship, are traced with chalk on the floor of an apartment called the 'mould-loft.' The length of the loft is generally equal to half that of the greatest ship which it may be proposed to build, and of the whole height of the hull in addition; so that there may be traced upon it a horizontal plan of half the ship in the direction of its length, and beyond one extremity of the plan a representation, in the same plane, of a transverse section of the ship in a vertical plane at the place of its greatest breadth. Such plan and section being laid down, there are drawn with chalk, from their proper places in the plan, representations of the timber ribs or frames as they would appear in as many transverse sections of the ship: pieces of plank about three-quarters of an inch thick are then cut so as to correspond to the forms of the timbers; and these, which are called the moulds, become the patterns by which the timbers are to be cut from the tree or log of wood. But, as such a mould can only give the form of the timber in the direction of its length, and as the oblique positions in which the timbers stand in the ship may cause the angle which the faces of each timber make with one another to be acute or obtuse, and to vary in the same piece, certain marks on the surfaces of the boards are used to indicate the directions in which the sides of the timbers are to be cut. The operation of cutting the timbers agreeably to the forms of the mould-boards is called 'converting.'

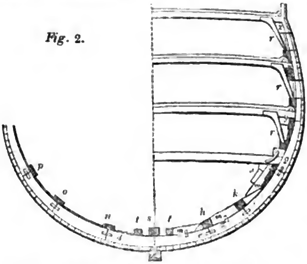
A row of blocks of oak three feet high and about four feet asunder are placed on the building-slip (ground cut in an inclined plane descending towards the water) in the direction of the length of the intended ship, so that their upper surfaces may be in a plane making an angle of about three degrees with the horizon; and on these blocks is laid the keel AB, *Fig.* 1. This, which is the lowest timber of the ship, extends from one end to the other, and upon it is raised the whole fabric; it is of elm, and for a large ship it consists of two or more pieces scarfed together at their extremities. Timbers, called the 'dead-wood,' are then placed at C and D longitudinally upon the keel from each extremity of the latter towards its middle; the upper surface of this mass is cut in a curvilinear form *b*, *b*, and with this line the bottom of the ship's body is to coincide. At A and B, the extremities of the keel, the stern-post, and stem-post are set up: the latter is curved near the bottom; and if the stern is to be what is called square, a particular frame, consisting of two transoms or horizontal timbers, and two side-pieces, is fixed above the stern-post, in order to determine the form which is to be given to this part of the ship. The sides and upper surface of the keel and dead-wood are cut to receive the floor-timbers (the lower portions, *d e*, *Fig.* 2, of those timbers which are to form the ribs of the hull): these are placed across the keel perpendicularly to its length, and the other portions (called 'futtocks), *e f*, *f g*, &c., of which each rib is formed, are placed successively above them, abutting end to end, or the head of a lower one against the heel of that which is immediately above it. The ends of the futtock pieces in every rib are made to fall near the middle of the length of those in the rib on each side of it; and they are united together by cylindrical coaks, or plugs of wood, which enter about two inches into those ends at the places of junction. *c*, *c*, *c*, &c., *Fig.* 1, represent sections of the ribs made by a plane passing longitudinally through the middle of the keel,

Fig. 1.



and the interior surfaces of parts of the ribs appear at *d*, *d*, &c. The ribs were formerly placed so that their planes were perpendicular to the keel, but Dr. Inman has disposed them so as to be in vertical positions when the ship floats upright. Except near the two extremities of the ship, their planes are perpendicular to a horizontal line drawn in the plane of floatation through the whole length; but at the bows always, and at the stern if the latter is to be curvilinear, the vertical planes with which the ribs on each side coincide are oblique to the length of the ship, in order that, on a horizontal plane, the proper curvature of the extremities may be obtained. The rib-timbers above the surface of the water are nearly rectilinear, but below that plane they are made with various curvatures. About the middle of the ship they have at bottom nearly the form of a semicircle, while towards the head and stern they form curves of contrary flexure, uniting on the keel with their lower concavities towards the exterior of the ship.

Fig. 2.



It may be observed that the keel of a ship is not horizontal, or parallel to the plane of floatation when the ship is in still water, but is made lower towards the stern than it is forwards, in order to allow greater length to the rudder, and thus increase the power of the latter in giving a direction to the ship's motion.

The keelson, *e e*, *Fig*. 1, is placed longitudinally above the floor-timbers, and immediately over the keel, and it is united to the latter by bolts which go through both, and through the floor-timbers: its transverse section is represented at *s*, *Fig*. 2. In large ships two additional keelsons, *t*, *t*, *Fig*. 2, about thirty feet long, are bolted to the floor-timbers sufficiently near one another that the *step* (foot) of the mainmast may rest upon them; they serve to relieve the bottom of the ship from the pressure of that mast, and strengthen it against the upward action of the water. The timbers E and F, *Fig*. 1, called the sternson and stemson, are also attached interiorly to the stern-post and stem-post, in order to increase the strength of the fabric.

The whole assemblage of rib-timbers is covered on the outside, and either wholly or partly on the inside of the ship, with planks of oak from three to six inches thick; and in order to make the latter bend so as to lie close to the curve surface of the ribs, they are, previously to being applied, moistened by steam: the exterior planking appears in the section, *Fig*. 2. The planks are fastened to the ribs both by bolts and trenails (plugs of oak from one to two inches diameter), which pass quite through the ship's side, and are tightened by wedges driven into them at each extremity.

When the ribs do not join closely side by side, it is recommended that, before the planking is applied, the intervals both on the exterior and interior sides of the ship should be filled up with pieces of wood three inches deep, and as long as the curvature of the ribs will permit; the lines of junction with the ribs being well caulked. The spaces between the exterior and interior pieces may be filled with cement. This filling up should take place over all the bottom of the ship at least as high as the plane of floatation, since it would afford great security in the event of the bottom planks being torn off by the ship striking a rock. Sir Robert Seppings however proposes that, for ships of war, where there are intervals between the principal rib-timbers, there should be introduced in those intervals other ribs extending from the keel up to the orlop or lower deck, since by this construction the lower part of the ship will be one compact mass of timber. He observes that the filling up of the spaces between the ribs not only adds to the strength of the ship by causing its bottom to have a solid thickness of about sixteen inches, but it tends to preserve the health of the crew, since those openings become receptacles for dirt, by which the air within the ship is vitiated. Channels, or water-courses, may be cut down the ribs at their interior lines of junction, and covered by planks or battens; by these channels the water is able to descend to the limber passage along the keel, and pass to the pump-well. For merchants' ships Sir Robert Seppings would have strakes, or courses, of thick planks extend longitudinally through the ship along the interior sides of all the ribs, and cover the abuttings of the futtock-pieces in each alternate rib: such strakes appear at *n*, *o*, *p*, in *Fig*. 2. He considers that no other interior planking would be required, but he recommends that battens should be fastened over the junctions of the ribs in the vertical planes.

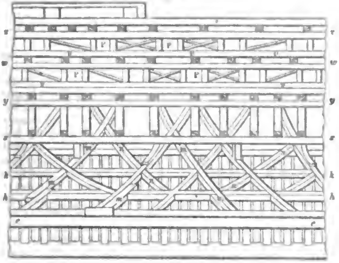
A ship being a vast fabric consisting of comparatively short pieces of timber connected together by scarfing, and the principal parts of the frame-work, the ribs, the longitudinal timbers, and the planks being nearly at right angles to one another, it must of necessity happen that when the ship is not supported in its whole length and breadth, it will bend by its own weight. This will take place not only in the event of being lifted up by a wave under some place in its length, or pressed unequally by the force of a wave acting obliquely upon one bow or quarter, but even while floating in still water, from an excess of the weight in one transverse section over that in another. In this last case it has occurred, a horizontal line having been traced from head to stern by means of a spirit-level while the ship was on the stocks, that immediately upon the ship being launched the two extremities were observed to sink as much as three or four inches; the ends of the planks separating in the upper part of the structure, while the timbers below were in a state of compression, and the whole body of the ship becoming curved in a vertical direction. M. Dupin has shown, *Phil. Trans.*, 1817, that the strain is greatest at that transverse section of the ship which divides the whole length into two parts, in each of which the weight of the displaced fluid is equal to that of the corresponding part of the ship and its loading. To counteract the tendency to arch or bend was the object of Sir Robert Seppings in the application of diagonal braces to the interior side of a ship.

Trussing ships to prevent arching was used on the Continent as early as 1759; and the Swedish architect Chapman, who describes the manner of placing the trusses, speaks of the practice as being generally followed. The method consisted in setting up three parallel rows of pillars from one end of the ship to the other; the middle row rested on the keelson, and the others on parallel longitudinal timbers, fastened by bolts to the ribs of the ship, one on each side of the keel: on the heads of these pillars in each row, and under the lower deck of the ship, was placed a longitudinal timber like an architrave; and diagonal braces were placed from the head of one pillar to the foot of the next in each of the three rows. It is evident that such a disposition of braces, if well executed, would serve to prevent or diminish the arching of the ship; but it is far inferior to the method now followed, because of the interference with the loading, and the liability of the pillars to be displaced in consequence of a violent movement of the ship.

In order to understand the construction of a ship and Sir R. Seppings's application of the braces, let *Fig*. 3 represent a part, near the mainmast, of a longitudinal section through a large ship of war. In this figure *e e* is the top of the keelson; *h h* and *k k* are timbers extending through the whole length of the ship above the ribs, which are supposed to be close together, and not covered by an interior planking; *m m*, &c. are the principal timbers of the braces; *n n*, &c. are the trusses to those timbers; *x x* is a longitudinal shelf, on which rest the beams of the orlop deck, and the section shows how it is supported on the braces *m m*, &c.; *y y* is a like shelf, on which rest the beams of the lower gun-deck. The beams which support the upper decks rest likewise upon longitudinal shelf-pieces, which appear at *w w* and *z z*; and these lie upon chocks or upon pillars placed against the sides of the ship at intervals between the decks; the same shelf-pieces appear at *x*, *y*, *w*, *z*, in *Fig*. 2. Through these and through the ribs pass the bolts by which the iron knees *r r r*, *Fig.* 2, are attached to the body of the ship. In small vessels the beams are not always fastened by iron knees, but are merely coaked and bolted to the shelf-pieces: two or more iron knees are however usually placed under the beam near the main and fore masts. The shelves just mentioned constitute as many hoops connecting the ribs of the fabric together longitudinally; they are fastened by trenails and bolts to the ribs and to the beams of the decks. P P, &c., *Fig.* 3, are the ports, and the dispositions of the braces between them are shown at *v v*, &c.

The connection of the two sides of the ship with each other is effected by means of the beams which extend under the decks from side to side. The tops of the iron knees are fastened to these, near their extremities, by bolts passing through them; and the lower parts of the knees are joined to the ship's side by bolts passing quite through the planking, the ribs, the chock-pieces, and the knees themselves The beams of the principal decks in large ships are usually made in two pieces which abut end to end, and are connected together by having a strong middle piece scarfed and bolted to them. The planks of the gun and upper decks are recommended to be laid obliquely above the beams, and their outer extremities enter into a rebate formed near the interior side of the ship in certain longitudinal pieces which are channelled for the purpose of carrying off the water from the decks: the diagonal position is given to the deck planks, in order that they may increase the strength of the ship in a transverse direction. The exterior planking of the ship is laid on the ribs in longitudinal directions as nearly as possible parallel to the surface of the water; and at the extremities of the ship bolts pass obliquely through them and through the stem-post, the stern-post, and the adjacent rib-timbers.

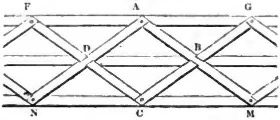
Fig. 3



The oblique timbers, or diagonal braces *m m*, &c. (*Figs.* 2 and 3), which are about six or seven feet asunder, cross the ribs at angles of about 45°, and are placed in contrary directions from the middle of each side towards each extremity of the ship. Their upper ends abut against the horizontal shelf under the lower gun-deck, and their heels or lower extremities against the keelson, or against the horizontal timber on each side of it. These braces are attached to the timbers of the ship by cylindrical coaks and bolts, and the lower ends are connected with the keelson by iron straps. The timbers *h h*, *k k*, which are of fir, are attached to the sides of the diagonal braces; and the truss-timbers *n n*, &c. are placed diagonally across the rhomboidal space formed between the principal braces and the longitudinal pieces, in order to prevent the former from becoming bent by the compression which they may suffer endways from any strain which the ship may experience. The diagonal frames, together with the oblique trussing between the ports in the upper works, not only resist the tendency of the ship to become arched, but the former resist also any pressure which may take place externally against the bottom of the ship in the event of grounding; at the same time the exterior planking, the longitudinal timbers, and the oblique planking of the decks bind the whole fabric in one firm body. A close contact of the several parts of the diagonal frames is evidently of the utmost importance, as on it depends the security of the ship against a change of figure.

The principle on which the diagonal braces act may be easily understood from the following considerations:—Let A M, A N, *Fig.* 4, be two principal braces; F D and D C, G B and B C, the struts or trusses inserted between them: then if C be the point of support, and if the parts beyond N and M be those which have a tendency to sink by the weight of the superstructure, it will follow from the elements of mechanics, that in this case the braces A M and A N, and the longitudinal timber F G, will be subject to the strain of extension in the direction of their lengths, while the trusses G B and B C, F D and D C, as well as the longitudinal timbers D B and M N, will be subject to the strain of compression. The effect of braces disposed in the positions A M, A N, in midships, and of others corresponding to them towards the head and stern, will be that the strain arising from the weight of the extremities of the ship, and by which arching is produced, is counteracted by the power of the trusses, in positions corresponding to F C and C G, to resist being compressed. A contrary effect would take place if the principal braces were disposed in the directions C F and C G, C being the point supported; for then the trusses between them, and the longitudinal pieces D B, would become disengaged, and would fall out of their places.

Fig. 4.



Sir Robert Seppings's diagonal braces were first introduced in 1810, and his paper on the application of them is contained in the *Philosophical Transactions* for 1814. They were first applied to the Tremendous; and the success was complete, for after three years' service it was found, by means of lines of sights along the ship, that the gun-deck had not arched in the least, and the upper deck only three-fourths of an inch.

In 1814, Mr. Walters, a civil architect, took out a patent for a method of counteracting the arching of a ship by braces of iron, which he proposed to apply on each side of the ship between the rib frames and the exterior planking. The braces were to extend obliquely both ways from the upper-deck beam in midships, in the direction of the line of shortest distance on the surface, towards the keel, where those which were on opposite sides of the ship were to meet under the bows and stern. By this disposition the extremities of the vessel could not sink without putting all the timbers between the trusses in a state of compression, and thus all their joints would be kept close together. No braces of such magnitude have ever yet been employed in ship-building, but diagonal braces of iron are now superseding those of timber; and for frigates and smaller vessels they are generally employed. The Goliah, now being built at Chatham for 80 guns, has, between the keel and lower gun-deck, an assemblage of iron braces let interiorly into the rib-timbers, which they cross at angles of 45°; over these, between the orlop and gun decks, comes an interior planking, which extends the whole length of the ship, and this also is crossed by braces of iron, bent, above and below the planking, so as to lie upon the ribs: to these the whole system of braces is bolted.

Vessels of iron are now very frequently constructed both for rivers and for navigation in the open seas, and they have many advantages over ships of wood. They are much lighter, or more buoyant. They are less liable to become arched, and are better able to withstand the effects of striking upon a rock. In the latter case, a ship of wood would have its bottom pierced, or it might go to pieces, while the iron one would merely become indented. They are formed with rib-frames at intervals, and with longitudinal hoops of iron; and they are covered with iron plates, which are fastened to the ribs by bolts or rivets. The lower part of the interior may be divided into compartments, which can be rendered air-tight; and thus, in the event of the bottom being perforated in any place, the water would be confined within that compartment till the damaged plate could be repaired or replaced.

The sheathing of ships at first consisted of a second covering of planks applied, on the exterior of the first, over the bottom and sides as far as they were under water; but this being found to impede the motion of the ship, a sheathing of milled lead (the invention of Sir Philip Howard) was subsequently employed. The application of plates of copper as a covering on the exterior of ships was first tried in 1760; and in 1783 all those belonging to the royal navy were ordered to be covered or sheathed with that metal. By this practice shells and sea-weeds are prevented from adhering to the sides and bottoms; the friction of the water against them is diminished, and the damage which would be caused by worms is avoided. The copper is said to remain serviceable from seven to ten years, except when a ship has been in seas which, like those on the western coast of Africa, abound with sulphuretted hydrogen; for then the copper is destroyed much sooner. The late Sir Humphry Davy proposed to protect the copper sheathing by the application of zinc, for which sulphuretted hydrogen has a stronger affinity than for copper; but though the experiment succeeded, no advantage resulted from it; for it was found that the copper, not being acted upon by the acid which prevents the adhesion of vegetable and animal matters, soon became foul.

The stability of a ship depending much on its breadth, and the lateral action of the wind on the sails being the force to which the stability is opposed, it follows that the heights of the masts or sails, and that of the common centre of gravity of the latter, ought to vary with the breadth of the ship; while the breadths of the sails must vary with its length. Now the momentum of the wind in the sails depending upon the breadth and height of the sails, and upon the place of their centre of gravity, that momentum must vary with the length of the ship and the square of its breadth; hence, in small ships, it is less proportionally to the stability than in great ships; and, on this account, the heights of the masts in the former are generally less in proportion to the breadth than in the latter.

The shrouds and back-stays are intended to enable the masts to resist the pressure of the wind when it acts in any direction aft of the beam: they are made fast to the sides of the ship at what are called the 'channels,' which are always rather aft of the mast to which they belong, in order that the action of the wind against the sails may be better resisted; and the 'dead-eyes' allow the shrouds to be relaxed or made 'tort,' as circumstances may require. The main and mizen masts are always made to rake, or incline aft; but the fore-mast is usually upright. The fore-stay and the main-topmast-stay should be in one line; so also should the main-stay and the mizen-topmast-stay. These stays serve to keep the masts steady, and resist the pressure of the wind when its direction is before the beam, as well as the strain produced by the action of the men on the braces.

The masts of ships are built of several pieces selected from the strongest parts of trees, and attached together both in the fore-and-aft and in the athwart-ship directions, the whole being bound together by hoops at intervals. Usually the central piece consists of one log of timber reduced to the form of a polygonal prism, and to the sides of this are applied other pieces, which are connected with it either by a longitudinal projection in each, which is let into a corresponding channel made in the central piece, or by blocks of hard wood which are let into both the central and attached pieces. In order that masts may more effectually resist the strain of torsion to which they are subject, it is sometimes the practice to form one of the surfaces, in each of two timbers which are to be applied together, in prismatic 'tables,' alternately elevated and depressed; so that when those surfaces are applied together, the raised parts in each may fit the depressed parts in the other.

The rudder serves to govern the ship's motion; for, on being turned so that its plane is in a position oblique to the plane of the masts and keel, the reaction of the water against it as the ship advances, being resolved in a direction perpendicular to the last-mentioned plane, becomes a force which causes the ship to turn upon a line passing through its centre of gravity. Thus by giving the rudder more or less inclination to the said plane, the ship may be made to move in any required direction, or may be made to avoid an object by which its safety might be endangered.

Ships have different designations, according to the number of their masts or the disposition of their sails. The word ship is more particularly applied to those vessels which have a fore, a main, and a mizen mast, with a top-mast and top-gallant-mast to each; and in which the yards, in sailing before the wind, are braced square, that is, in horizontal positions perpendicularly to the length of the ship: the mizen sail alone being usually in a fore-and-aft position, that is, in a vertical plane passing through the keel. A bark is a vessel with masts and sails like those of a ship, except that the mizen-mast carries no top-sail or top-gallant sail. A brig has a fore and a main mast, with top and top-gallant masts and sails, like those of a ship; but it has no mizen-mast, and the main-sail has a position corresponding to that of the mizen-sail in a ship with three masts. A snow is rigged in the same manner as a brig, except that the main-sail is attached to a small mast abaft of and very near the main-mast. A schooner has two masts, and the sails attached to them are, in their usual position, in vertical planes passing through the keel: it has small or no top-sails. Lastly, a sloop (shaloop) has only one mast, with a main-sail, whose plane is usually in a fore-and-aft position. Each of the different kinds of ships has a bowsprit which carries a fore-stay-sail and a jib-sail.

In the British Navy, ships which carry 70 or a greater number of guns are called 'line-of-battle ships.' Frigate is a term which is supposed to have been first applied to a light galley moved by sails or oars; but it is now applied to ships of war, generally with two decks, and carrying from 36 to 60 guns. These are built narrower than line-of-battle ships in proportion to their length, and sail swiftly; and such vessels were first, in 1690, constructed in England by Commissioner Pett. They accompany fleets in order to watch at a distance the movements of the enemy, and they act singly against ships of a like kind. Ships of war of a lower class than frigates have the denominations of sloops, corvettes, brigs, cutters, brigantines, ketches, schooners, and barques. The sloops of war and corvettes carry from 4 to 20 guns, and some brigs carry 16 guns: the number of guns in a vessel of either of the remaining classes does not exceed 10.

The tonnage of a ship is, properly, an expression for the interior capacity by the number of tons of sea-water which it could contain; therefore, if the interior volume were found in cubic feet, on dividing that volume by 35 (the number of cubic feet of sea-water which are equal in weight to one ton), the quotient would be the tonnage required. The tonnage however is frequently understood to express the capacity by the number of tons of sea-water which might be contained between a horizontal plane passing through the ship when she floats in still water with only her equipments and stores on board, and a horizontal plane passing through the ship when laden, that is, between what are called the *light-water* and *load-water* planes; the volume of that part of the ship expressed in cubic feet being divided by 35, as in the other case. This result evidently gives the weight of the ship's cargo merely.

As the application of the usual rules of mensuration to the determination of the tonnage in either of the above cases is very laborious, several different methods have been proposed by which an approximate value of the tonnage may be more easily found. The rule formerly employed in this country, agreeably to the acts of parliament 13 Geo. III. and 26 Geo. III., is expressed by the formula $\frac{b^2}{188}(l-\frac{3}{5}b)=$ T, where l is the length of the ship at the load-water plane, b the exterior breadth at the broadest part of the ship, and T is the tonnage required; but it may be easily shown that the rule, probably from subsequent alterations in the forms of ships, is very erroneous.

In 1791 the Society for the Improvement of Naval Architecture offered a premium for the most accurate method of determining the tonnage of ships by rules including the values of all the principal dimensions; and, in the following year, M. Chapman gave two rules, in one of which the element is expressed by $\frac{(lb)^{\frac{3}{2}}}{y}$, and in the other by $\frac{l.b.d}{x}$, where l is the extreme length on the load-water plane, b is the breadth just below the main-wale, and d is the mean vertical distance between the light and load-water planes; x and y are variable divisors depending on the fullness or sharpness of the bodies of the ships. The last of the above formulæ may be made to express the tonnage very near the truth if x be made equal to 46·67, and if the result be multiplied by the value of the fraction $\frac{3s-(n-2)h}{2(n-2)}$. Here n denotes the number of equal parts into which the length of the ship may be divided on a plane midway between the light and load-water planes; s is the sum of the half-breadths, or horizontal ordinates taken to the outside of the ship at the several points of division, and h is the greatest ordinate.

A committee appointed by the Lords Commissioners of the Admiralty to consider the measurement of tonnage, state in their Report (1834) that they conceived it to be preferable, as well for the interests of the builder and owner as for the collection of the dues, that the registered tonnage should depend on the whole interior capacity of the ship; and they gave as a rule for computing it, the formula $\frac{l.b.d}{x}=\text{T}$, in which l is the interior length of the vessel, at half the midship depth, from the after part of the stem-post to the fore part of the stern-post; d is the sum of the depths of the ship between the under side of the upper deck and the ceiling (interior surface) at the limber, taken at three points in the length, viz. one in the middle, and one at a distance from each end $=\frac{1}{6}l$. The depth at the middle point is to be doubled and added to the two other depths. b is the sum of the inside breadths of the ship taken at two points in each of the three lines of depth above mentioned, viz. at $\frac{1}{5}$ and at $\frac{4}{5}$ of the depth on the foremost and on the aftermost line of depth, and at $\frac{2}{5}$ and at $\frac{4}{5}$ of the depth on the middle line. The breadth taken at $\frac{2}{5}$ of the depth on the middle line is multiplied by 3, and that taken at $\frac{4}{5}$ of the depth on the aftermost line is multiplied by 2, before the addition is made. x is an arbitrary divisor which has been fixed at 3500, and was found from the equation $x=\frac{l.b.d}{t}$, in which the value of the second member was obtained by admeasurements of ships of different classes, and by taking a mean of the results, t being the computed value of the tonnage.

In order to find approximatively the tonnage of loaded vessels by the above formula, the committee proposed that l should represent the interior length of the ship at the upper deck, b the interior breadth on the under side of the same deck, d the depth from the upper deck measured down the pump-well, and $x=130$.

Both of these rules are empirical; but, on comparing the result obtained by the first with the interior volumes of vessels computed by the general rules of mensuration, it was found that out of fifteen cases it was in defect in nine, and in excess in three: the greatest error in defect was only 2 per cent., and in excess 6 per cent.; the rule is therefore considered to be sufficiently accurate for the objects proposed by it.

It would be convenient to have for every ship a scale of tonnage, or a table of the number of tons corresponding to different depths of the displacement, suppose at intervals of one foot; for by such scale or table the tonnage expressing any portion of the whole burthen which the ship can carry might be found by inspection from the observed depth to which the ship is immersed in the water; and the following construction has been proposed by Mr. Parsons:—Let a line on paper represent a vertical line drawn through the middle of the ship, and be divided into equal parts representing the feet in the depth. The weights of displacement in tons corresponding to different heights from the keel upwards, being computed by the rules of mensuration, may be set by a scale on horizontal lines drawn through the former line at the points which represent the depths of the displacement. Then the extremities of these lines being joined by a curve, the latter becomes a line of tonnage; and on measuring the horizontal ordinates by the above-mentioned scale, the tonnage corresponding to any height above the keel of the ship will be obtained.

SHIPS. The law of England relating to merchant ships and seamen is partly founded on principles of maritime law common to the whole civilized world, and partly on acts of parliament. The subject may conveniently be divided into four parts:—

1. That relating to the ownership of ships and its incidents.
2. To the persons employed in the navigation, &c. of merchant ships, their rights and duties, &c.
3. To the carriage of goods and passengers in merchant ships, the rights and duties, &c. of freighters and passengers, of owners and their servants.
4. To the employment and wages, &c. of merchant seamen.

1. The ownership of a ship is vested, in the first instance, in those at whose expense it has been built. It may pass into other hands by purchase, by the death, bankruptcy, &c. of the owners, or by capture from an enemy. In all these cases, the general law relating to chattels is observed, subject to certain modifications applicable to this kind of property. A sale by a party who has the mere possession of a ship can in no instance vest the property in the purchaser. Neither can the master, except when the clearest necessity exists, sell the ship which he commands. Even if he be a part owner, his sale is valid only so far as his own part is concerned; and in the case of a registered ship, even supposing him to have an authority from the owners to sell, still it is incumbent upon him to observe the forms prescribed by the registry acts. A necessity for a sale may arise when the ship is in a foreign country, where there are no correspondents of the owners, and the master is unable to proceed from want of repairs, and no money can be obtained by hypothecating her or her cargo. In case a sale under such circumstances should be litigated, the proper questions for the jury to determine are, whether such a necessity existed as would have induced the owner himself, if he had been present, to sell; and whether the actual sale has been made *bonâ fide*. No inquisition by any court having authority abroad in such matters is conclusive upon those whose property is in question. The property in a ship is now always proved by written documents; and by means of these the property in an absent ship may be conveyed. But when actual possession is possible, a delivery of it is also necessary to convey a perfect title; otherwise, in the case of the bankruptcy of a seller who is allowed to remain in possession, the property may vest in the assignees. Previous to the passing of the registry acts, 4 Geo. IV., c. 41, and 6 Geo. IV., c. 110, 3 and 4 Wm. IV., c. 55, the same consequences might have ensued from the continued possession of the original owner, in the case of ships mortgaged or conveyed to trustees for the payment of debts. But by the 42nd and 43rd sections of the last act, provisions are made for a statement of the object and nature of the transfer in the book of registry, and for indorsement on the certificate of registry, by which such consequences are prevented. Enactments to the like effect are made in the bankrupt act, 6 Geo. IV., c. 16, § 72.

In order to complete a title by capture, it is necessary that a sentence of condemnation should be obtained in a court of the nation by whom the capture has been made. This court decides according to the general law of nations. A distribution is thereupon made among the captors, for which purpose it is usual for a sale of the vessel to take place. At the time of the condemnation the ship need not be in the country where the condemnation takes place. The court at which the condemnation takes place may be in the country of a neutral power, as well as in that of the capturing power or of its allies, although this principle was admitted reluctantly, and after several decisions to the contrary in England. The property in a ship is not changed by a seizure and a sale without condemnation of a neutral state, nor upon a capture by pirates.

Where repairs have been done, or necessaries supplied to a ship, the legal owners, upon proof of their title to the ship, are *primâ facie* presumed to be liable. But this presumption may be rebutted by proof that they were done or supplied under the authority and upon the credit of another. The question to be decided, in order to determine the liability, is upon whose credit the work was done or the necessaries supplied. If a ship is let out for hire, the owners are no more liable for the work done by order of the hirers, than a landlord of a house would be for work done by order of his tenant. Analogous observations are applicable with respect to the liability of mortgagees and charterers. Where there is an actual letting of the whole ship, and the lessee has the entire control and management of her, the master and mariners being subject to his orders, the lessee becomes for the time invested with the character of owner. But where by the terms of the contract the master and mariners continue subject to the owner, and he through them retains the control and management of the ship, the contract is merely for carrying the lessee's goods.

A variety of privileges of trade are now confined to ships either of British build, or taken as prizes in war, &c.

The first statute passed with a view to effect this object was 26 Geo. III., c. 60. Other statutes, 4 Geo. IV., c. 41, 6 Geo. IV., c. 110, and 3 and 4 Wm. IV., c. 55, were subsequently passed for the same purpose. The object of the legislature has been to confine the privileges of British ships to ships duly registered and possessing a certificate of registry. No ship is to be considered a British ship unless duly registered and navigated as such. There are some exceptions from this enactment: 1, British-built vessels under 15 tons burden, and manned by British subjects, navigating the coasts and rivers of the United Kingdom or of the British possessions abroad; 2, British-built vessels owned and manned by British subjects, not more than 30 tons burden, employed in fishing or the coast-trade about Newfoundland, Canada, &c.; and, 3, Ships built at Honduras, which, under certain circumstances, are entitled to the privileges of British registered ships. It is to be observed that the registry of a ship is not compulsory; the only consequence of non-registry is, that a non-registered ship can enjoy none of the privileges of a British ship. No ships can be registered which are built elsewhere than in the United Kingdom or in some of its colonies or dependencies, or have been condemned as prize, &c., or as forfeited for breach of the laws relating to the slave-trade. They must also wholly belong to British subjects who reside within the British dominions, or are members of some British factory, or agents for some house carrying on trade in the United Kingdom. A registered ship may cease to enjoy the privileges of British ships, by sale under the decree of a court for benefit of the owners in consequence of being stranded, by capture, by repair to the amount of 20*s.* per ton in a foreign country, unless she was sea-worthy when she left the British dominions, and the repairs were necessary for her return. Every ship is considered to be divided into 64 equal parts, and no individual or partnership firm can be registered as owner or owners of less than a 64th part. Proper officers, who generally are the officers of customs on the spot in question, are appointed for the purpose of making the registry and granting certificates of registry to the owners. The registry and certificate must be made at the port to which a ship belongs, which is that port at or near which the owner resides who takes the oath required by the act. The certificate states the name, occupation, and residence of each owner, and the share or shares which he holds, the name of the master, the name of the ship and of her port, the time and place of her build or condemnation, the name of the surveying-officer, her tonnage, and contains a particular description of her in other respects. On the back of the certificate are stated the names of the owners, and the share or shares held by each. The name of the ship cannot afterwards be altered. When the property in a ship or any part of it is transferred, it must be done by a written instrument or bill of sale, which recites the contents of the certificate. The property in the ship is not conveyed until the instrument has been produced to the proper officer at the port where the ship was registered or is about to be registered afresh. The officer then makes a registry in accordance with the altered circumstances of ownership, and indorses them on the certificate; of this he must give notice to the commissioners of customs. The transfer is rendered complete by an indorsement on the bill of sale certifying the entry in the registry and the indorsement. If the master of a ship is changed, notice of it must be given to the proper authorities, and a memorandum and indorsement of the change must be made in the registry and on the certificate. If a certificate is lost, a fresh registry must be made for the purpose of granting another; and the same form is necessary in case of any alteration in the ship which creates a variance in the particulars stated in the previous registry. The only conclusive evidence of ownership of a ship is the registry and certificate; but a production of the registry alone is not even *primâ facie* evidence to render a party liable as owner of a ship. There must be some proof either that he has caused his name to be entered, or has assented to its entry; neither is it evidence to support an allegation of title by the party producing it; as, for instance, to prove interest in a plaintiff in an action on a policy of insurance.

Where a ship is the property of several part-owners, the rules of most nations have made provision for the administration of the joint property in case of a disagreement as to the management among the joint-owners. The English law contains similar provisions. The majority in value are authorised to employ the ship 'upon any probable design;' but they are only entitled to do so upon giving security to the minority in a sum equal in value to the united shares of the latter. The mode of obtaining this security is by procuring a warrant from the court of Admiralty for the arrest of the ship. After the security has been given, the minority bear no share either in the expenses or profits of the adventure. If no application of this kind is made to the court, the minority ought expressly to give notice of their dissent both to their joint-owners and all other parties engaged in the proceedings, and they will then be relieved from the necessity of contributing in case of a loss. If they take no steps of the kind, their joint-owners, as in the case of partnership of any other chattel, will not be responsible to them for any consequences short of an absolute destruction by their means of the ship. The same proceedings are proper to be taken where the joint-owners are equally divided in opinion, or the minority have obtained possession of the ship. The application for the arrest should be made at the earliest stage of the proceedings, because otherwise the applicant will be held liable to contribute to the previous expenses, although he will receive no part of the profits. One part-owner may make the others liable for repairs, &c. done at his order: the usual practice however is for the part-owners to unite in appointing one person as a general agent for them all. This person is styled the ship's husband, and his duty, when not especially defined, is to attend to all matters connected with the outfit and freighting of the ship. It is not however within the limits of his authority to effect an insurance. If he make any advances, he can sue those part-owners on whose behalf the advances are made for what is due to him. In case of disagreement among the part-owners as to the settlement of accounts concerning the expenses and earnings of a ship, the ordinary remedy is by a suit in equity.

2. *As to the persons employed in the navigation, &c. of ships, their rights and duties, &c.*—The master is the commander of the ship; he has the sole conduct and management of it. By virtue of his employment as such, he is civilly responsible for any injury done to the ship or cargo in consequence of his negligence or incompetence. Those who are employed under him are styled mariners and seamen. In every British ship he must be a British subject, and three-fourths of the crew must be British seamen. (3 & 4 Will. IV., c. 54.) In vessels employed in the coasting trade and in voyages between the United Kingdom and the Channel Islands, all the crew must be British seamen. No person is qualified to be master or deemed to be a British seaman except natural born subjects, or those who have been naturalized or made denizens, or become British subjects by conquest or cession of territory, and who have taken the oath of allegiance or fidelity, or who have served on board a ship of war during war time for three years. During war time this period may be limited by royal proclamation to two years. The natives of the British dominions in the East Indies are not British seamen, and there are certain legal provisions relative to their employment. Those ships which are not required to be wholly navigated by British seamen are deemed to be duly navigated if they have on board British seamen in the proportion of one to every 20 tons of the ship's burthen. The legal proportion of British seamen may also be diminished by royal proclamation.

The master has power to bind the owners by entering into engagements with third parties relative to the employment of the ship. Such engagements are of two kinds:—1. A contract by which the whole ship is let to hire during an entire voyage, which generally is accomplished by a sealed instrument called a charter-party. 2. A contract with distinct persons to convey the goods of each, in which case the ship is called a general ship. Such contracts made by the master, being within the lawful scope of his employment, are legally considered to be made by the owners who employ him; and in either case they or the master are liable in respect of these contracts. If the charter-party is made in the name of the master only, it will not support a direct action upon it against the owners. Still if the contract is duly made, that is, within the usual employment of the master, and under such circumstances as afford either direct proof of authority or evidence from which such authority may be inferred, the owners may be made responsible either by a special action on the case or by a suit in equity. But the master cannot be assumed to have a power to annul an express contract entered into by the owners themselves and to form a fresh contract with other parties. Besides this power which the master has to bind the owners by his contracts relative to the lading of the ship, he has also athority to render them liable for repairs done and provisions and other things furnished for her use, or for the money which he has expended for such purposes. In this case also the remedy of the creditor is against the master, unless by express contract the owners alone are rendered liable, and also against the owners. If the contract is made by the owners themselves, they alone are liable. The English law does not follow the rule of the civil law, by which a party who had repaired or furnished a ship had a claim on the ship itself in preference to all other creditors. A party who has done repairs upon a ship has a right to retain the possession of it until his demands are paid; but if he gives up possession, he is on the same footing as other creditors. When however the ship is abroad, and the necessary expenses cannot otherwise be defrayed, the master has the same power which the owners or part-owners to the extent of their shares under all circumstances have, to hypothecate the ship and freight as a security for debts contracted on behalf of the ship. The contract of hypothecation is called a contract of bottomry, by which the ship upon its arrival in port is answerable for the money advanced, with such interest as may have been agreed on. By the terms of the contract the repayment of the money is made to depend upon the accomplishment of the voyage, and, in consideration of the risk, the lender is permitted to receive a higher than the legal rate of interest. By such hypothecation the creditor acquires a claim on the ship. When the claim has been created by the master abroad, it may be enforced by suit in the Admiralty; but if the ship has been hypothecated by the owners at home, the parties can only have recourse to the common law or equity courts. The Admiralty and the equity courts will recognise the interest of the assignee of a bottomry bond, though at common law he cannot sue in his own name. In general the master has been held not to be authorised to raise money on bottomry within any part of the same country where the owners reside, on the ground that it is his duty to communicate with them before entering into such a contract. But where by reason of hostilities communication with the owners was almost impossible, and immediate necessity existed for the money, which could not be procured otherwise than upon bottomry, a master was held to have authority to raise it on those terms. When money is lent on bottomry, the owners are not personally responsible. The credit is given to the master and the ship, and the remedy is against them only. Still if a party is not content with such security, the master may also render the owners liable. The master cannot hypothecate the ship for a debt of his own, nor can he give a bottomry bond for matters not within the scope of his authority. If the sums secured by the bond are not repaid, an application must be made to the Court of Admiralty, founded on the instrument of contract and an affidavit of the facts, upon which a warrant issues to arrest the ship, and the persons interested are cited to appear before the court, which then decides what is to be done. If several bonds have been given at different times, the latest in point of time is entitled to be first satisfied, a rule derived from the civil law. (*Dig.* 20, tit. 4, s. 5, 6.) If the necessary amount of money cannot be raised by hypothecating the ship and freight, the master may also sell part of the cargo or pledge it.

The whole of the services of the master are due to his employers; and if he occupy himself on his own account, and the money earned by him is paid to his employers, they can retain it. It is his duty to give information to the owners of every matter which it may be material for them to know.

The statute which now embodies the regulations relative to mariners is 5 & 6 Wm. IV., c. 19; the object of which was, 'To amend and consolidate the laws relating to the merchant seamen of the United Kingdom, and for forming a register of all the men engaged in that service.' The statute furnishes forms for the agreements into which seamen ought to enter. These agreements must be in writing, and any agreement inconsistent with them or with a seaman's right to freight earned by ships lost before the final conclusion of a voyage is not binding. The seaman does not by signing the agreement lose his lien upon the ship, or lose any remedies which he before had for the recovery of wages, or which he was before entitled to against the ship, the master, or the owners. Any loss to the cargo or stores by embezzlement, negligence, or wilful act, may be made good out of the wages of the seamen who are guilty of such acts, and an incompetent seaman is subject to a reduction of wages. The seaman engages to serve and conduct himself in a diligent, faithful, and orderly manner, and to obey the lawful commands of the master. By the common law a seaman was liable to personal restraint, correction, and dismissal for breach of duty; but the act imposes certain other penalties, and provides for his summary punishment on application before a magistrate in any part of the British dominions.

A seaman is not entitled to any additional remuneration on the occasion of danger or extra labour from the perils of the sea. If the vessel be wrecked, it is his duty to exert himself to take care as much as possible of the cargo; and if the ship arrives safely in port, the seaman is not justified in leaving her before he has assisted in completing the delivery of the cargo. But if the master propose to take the ship to some place not mentioned in the articles, the seamen are justified in leaving her; and they are not bound to continue on board if they are insufficiently provided with food and other necessaries; or if the master misconducts himself or maltreats them. By desertion a seaman forfeits his claim to wages.

If the correction or restraint by the master has been unwarranted or excessive, he is responsible to the seamen in an action at law, or by proceedings in the Court of Admiralty. In case death is caused by the punishment administered, the master is subject to criminal proceedings, which are conducted and regulated by the usual rules of law. Offences committed at sea may, under the Admiralty commission, or under a commission issued by authority of 4 & 5 Wm. IV., c. 3, be tried and punished as if committed on shore. The master may himself use force and imprisonment to repress the commission of crimes; but for the purpose of punishing crimes committed at sea, magistrates are authorised to receive informations, and commit the offenders for trial; and by 5 & 6 Wm. IV., c. 19, they may inquire into and determine complaints of assault and battery committed at sea.

As to the offence of **BARRATRY**, see that article.

The statute 11 & 12 Wm. III., c. 7, made perpetual by 6 Geo. I., c. 19, and 18 Geo. II., c. 30, defines various acts which shall be held to amount to piracy; and by 7 Wm. IV., and 1 Vic., c. 88, s. 3, persons convicted of the offences so held to amount to piracy, are liable to be transported for life, or not less than fifteen years, or imprisoned for three years. By 16 Car. II., c. 6, and 22 & 23 Car. II., c. 11, it is enacted that the master of any vessel of not less than 200 tons burden, carrying sixteen guns, shall not yield to pirates of any force without resistance, on pain of incapacity to command any English vessel afterwards. A ship of less burden is forbidden to yield to any Turkish pirate not having double her guns without fighting; and if any mariners or inferior officers refuse to fight when commanded, or discourage other mariners from doing so, they shall lose their wages and their goods on board, and be liable to imprisonment with hard labour for six months. If any officers or seamen are killed or wounded during the engagement, and the ship nevertheless arrives at her destined port, provisions are made by 11 & 12 Wm. III., c. 7, for levying a sum of money not exceeding two per cent. on the cargo and freight, and distributing it among the master, officers, and seamen of the ship, or the widows and children of the slain. This is done under the superintendence of the judge of the Admiralty Court or his surrogate in London, or the chief civil officers in other parts. By the 20 Geo. II., c. 38, a corporation was formed and provision made for raising a fund for building an hospital, &c. for the relief and support of wounded and disabled seamen and the widows and children of such as are killed or drowned in the merchant service. Further regulations respecting it are made by 4 & 5 Wm. IV., c. 52. All masters and owners working their own ships contribute two shillings, and other seamen one shilling a month towards this fund. This contribution is to be deducted from their wages, and for that purpose the master keeps a muster-roll of the seamen, in which all must be entered and described, and various particulars entered respecting them. A duplicate of this roll is delivered to the collectors of duties at the place in the United Kingdom where the ship discharges her cargo. By 4 & 5 Wm. IV., c. 19, a mariner falling sick or being hurt during the performance of his duty is to be cured at the expense of the ship. If seamen are cast away, &c., or in distress in foreign parts, it is enacted by 4 Geo. IV., and 1 Wm. IV., c. 20, s. 82, that the British consul there resident, or, where there is no consul, two more British merchants, shall support them and put them on board the first king's ship that touches at or near the place; or if no king's ship can be found, then on board some merchant ship. The expenses are defrayed by the commissioners of the navy. If a master in foreign parts force a seaman or any person belonging to his crew to go on shore abroad, or wilfully leave him behind when he is ready to return, he is guilty of a misdemeanor, and liable by 11 & 12 Wm. III., c. 7, and by 5 & 6 Wm. 4, c. 19, to fine and imprisonment. And in case he has afterwards been relieved while abroad in the manner before provided for, the master or owners are liable for all the expenses, which may be recovered with costs of suit in the same manner as a debt due to the crown.

3. *Of the Carriage of Goods and Passengers in Merchant Ships, the Rights and Duties, &c. of Freighters and Passengers, of Owners and their Servants.*—The contracts under which goods are conveyed in a ship are, as has been already stated, of two kinds, the contract by charter-party and the contract for their conveyance by a general ship. The former is 'a contract by which an entire ship, or some principal part thereof, is let to a merchant for the conveyance of goods on a determined voyage to one or more places.' A charter-party is a written instrument, generally, though not necessarily, under seal, which is executed by the owners or the master, or the owners and the master of the one part, and by the merchant or his agent of the other part. The word charter-party is derived from the two words *charta partita*, 'divided charter,' because the duplicates of the agreement were formerly written on one piece of paper or parchment and afterwards divided by cutting through some word or figure so as to enable each party to identify the agreement produced by the other. If the charter-party is by deed, and executed by the master, and the owners are not parties to it, they cannot bring a direct action upon the instrument; indeed the owners can never bring an action upon it unless their names appear as the parties executing it. But an action may in all cases be brought against the owners for a breach of their duties generally as ship-owners relating to matters not inconsistent with the terms of the charter-party. The charter-party states the port or ports of destination and the freight to be paid, which may be either a gross sum or so much per ton, or so much for each tub or cask of goods. If the agreement is not to pay a certain sum for the entire ship, or a certain portion of it, but to pay so much per ton, the merchant generally covenants to load a fixed amount or a full cargo. The charter-party generally also states the burden of the ship, but this statement, where there is no fraud, is not binding on the parties. The merchant may load with his own goods or those of others, or he may underlet the ship altogether. The master or owner usually covenants 'that the ship shall be tight and staunch, furnished with all necessaries for the intended voyage, ready by a day appointed to receive the cargo, and wait a certain number of days to take it on board. That after lading she shall sail with first fair wind and opportunity to the destined port (the dangers of the sea excepted), and there deliver the goods to the merchant or his assigns in the same condition they were received on board; and further that during the course of the voyage the ship shall be kept tight and staunch, and furnished with sufficient men and other necessaries to the best of the owner's endeavours.' The merchant usually covenants to load and unload the ship within a specified time.

The charter-party dates from the day on which it is delivered or signed. The terms generally used may of course be varied so as to meet the intention of the parties. They cannot be altered nor suppressed, nor others added by any verbal statements, but they may be explained by evidence of the usage of general trade, or of the usage of that particular trade in reference to which the charter-party is made. The charter-party also generally contains two covenants which seem to be wholly inoperative: one, by which the merchant binds himself and the cargo; the other, by which the owner binds the ship and freight in a penal sum for the performance of their respective covenants. In an action on the charter-party the actual damages proved will determine the amount to be recovered; and they will neither be limited nor extended by the penal sum named; and although by the general maritime law the ship and freight might be made directly available, there are no means for accomplishing that object in this country. As to the cargo, it is always subject to the general law of lien.

Under a contract of affreightment doubt often exists as to whether the goods conveyed are in the possession of the party entitled to the payment, and consequently there is doubt as to his having a lien on the goods. The question to be decided is whether the owner has parted with the possession of his ship. If he has entirely surrendered all control over the ship to the merchant who has chartered her, the merchant must be considered for the time as in possession of the ship. The goods on board therefore will be in his possession, not in the possession of the actual owner, who accordingly under such circumstances will have no lien on the goods for the payment of the freight. But it must clearly appear from the language of the charter-party taken altogether, and explained by the circumstances of the employment of the ship, that it was intended that such a complete demise of the ship should be made, one of the rules of construction being to interpret such instruments 'agreeably to the nature of the contract that a prudent shipowner would make.' The right of lien always exists where the freight is to be paid before or on the delivery at their place of destination of the goods, or even, as Lord Tenterden himself decided (2 Barn. and Ald., 603), where there is 'nothing to show that the delivery of the goods was to precede the payment of that hire.' All these difficulties may be avoided by inserting a clause in the charter-party expressly stating whether it is meant that the owner should have a lien upon the lading for his freight and expenses. The owner does not lose his right of lien by depositing the lading in a public warehouse, provided he gives notice that it is to be detained until his claim for freight is satisfied.

If either party is not ready to perform the contract contained in the charter-party by the time agreed on, he is liable to an action for non-performance of his contract, and the other party may form fresh contracts with third persons.

The charter-party generally contains a clause by virtue of which the freighter is entitled to detain the ship a certain further number of days for the purpose of loading and unloading her, on payment of a fixed sum per day. This payment and the time during which it occurs are both called demurrage. These days, when it is not otherwise provided for, are calculated from the time of the arrival of the ship at the usual place of loading or discharge, and are taken to mean working-days. If the freighter detains the ship beyond the time fixed, he is liable to an action on this breach of the agreement, even if he was not the cause of the delay and it was impossible to avoid it; unless indeed by the laws of his country the contract or the fulfilment of it was illegal. If there is nothing to show a special loss or injury on the part of the owner, the damages are measured by the scale fixed by the parties in determining the amount to be paid per day for demurrage. But if the ship be detained or the port of discharge be occupied by enemies, the freighter is not bound to pay demurrage for delays created by such causes. Demurrage payable while a ship is waiting for convoy or for cargo, ceases when the convoy is ready or the ship fully laden and cleared out. If after such time she is detained by the weather, no demurrage is payable.

When a ship or a principal part of it is not let out by charter-party, the owners contract with several merchants respectively for the conveyance of their goods. A ship so employed is called a general ship. The terms of the contract appear from the instrument called a bill of lading, two or three of which are signed by the master after the ship has been loaded. If any notice or advertisement relative to the destination of the ship has been issued, care should be taken that these are accurate, otherwise the owners may be liable for the consequences of the misstatement. The terms of the bill of lading must be made out according to the direction of the shipper, or, in case a receipt has been given on the delivery of the goods on board, of the holder of the receipt. The form of a bill of lading is stated in a former article. [Bill of Lading.]

The master ought to be provided with one bill of lading. On signing the bill of lading, he should receive the receipts which he may have given for the goods. By the statements of the bill of lading the master and his owners are bound as regards third parties, but not as regards the merchants who have shipped the goods. As between the master or owners and the shippers, the bill of lading is in the nature of a receipt, which is only evidence of the matters which it states, and is subject to be contradicted by proof of the real facts. In case of an action for any breach of their implied contract as carriers, against the master or owners, the party who owns the goods mentioned in the bill of lading must be the plaintiff. This will be the consignee of the goods, unless the peculiar circumstances of the case are such as to deprive him of that character. If it is considered necessary to make any provisions relative to demurrage, they are generally inserted in the margin of the bill of lading.

A contract for the conveyance of goods may be rescinded by the act of the parties or by circumstances over which they have no control. If the contract is under seal, it ought, with a view to proceedings in the courts of common law, to be discharged by an instrument of the same nature; but if the facts show an intention in both parties to rescind the contract, a court of equity will interfere in that behalf. Where the goods have been laden and bills of lading signed, the master ought to receive back all the bills of lading or be indemnified for the consequences of having signed them, if the contract of conveyance is to be put an end to; and he has a right, in the absence of any fresh agreement to the contrary, to retain the goods till the freight which he might earn upon them has been paid. If after the contract for conveyance has been entered into, the fulfilment of it becomes unlawful in consequence of some act of the government of the country, such as a declaration of war, a suspension of commercial intercourse, or a prohibition to export, the agreement is dissolved. But nothing short of absolute unlawfulness can excuse the performance of the contract. A contract is not dissolved by the temporary restraint of an embargo, nor, as it seems, of a blockade of the port of departure. But a blockade of the port of destination dissolves the contract, because to sail to a blockaded port with the premeditated intention to break the blockade is an offence against the law of nations. If a party has absolutely contracted to furnish a lading for a ship on her arrival at a foreign port, and is prevented from doing so in consequence of any law or regulation merely municipal of the foreign country, this will not excuse the non-performance of his contract: as where the export of the articles contracted to be laden is prohibited or where intercourse is forbidden in consequence of the prevalence of an infectious disorder. In such cases and where from any other cause the correspondent of the merchant is unable to furnish a freight, and gives information of that to the master, he cannot, by afterwards remaining at the port the days prescribed, entitle the owners to demurrage.

In all matters that regard the ship, the master has within the scope of his duty an unlimited authority over the passengers as well as over the crew. A passenger may quit the ship, but while he remains on board he is bound in case of necessity to do work that is required for the service of the ship and to fight in her defence. If he thwart the master in the exercise of his authority or otherwise misconduct himself, he may lawfully be put under restraint or imprisoned. If the conduct of a passenger be unbecoming, or if he threaten the master with personal violence, he may be excluded from those parts of the ship which are frequented by the superior passengers, although he has paid such a fare as entitles him to be admitted there. If a passenger feels himself aggrieved by the manner in which he has been treated, he may bring an action against the master, and it will be for the jury, under the direction of the judge, to say whether he has any ground for complaint. In addition to this general right of action, several statutes have been passed to regulate the conveyance of passengers. Those now in force are 6 Geo. IV., c. 116, which relates to ships carrying passengers from places in the United Kingdom to places out of Europe and not within the Straits of Gibraltar. It regulates the proportion of passengers carried to the tonnage of the ship, provides security for the sea-worthiness, cleanliness, &c. and proper storing of the ship, for the presence of a surgeon and medicines, for the delivery of a list of passengers to the collector of customs at the port of departure, and attaches penalties to a violation of the regulations which it contains. Ships in the service of the crown or the post-master-general, or the East India Company, or bound to the Newfoundland fisheries or the coast of Labrador, are excepted from the operation of the act. The commissioners of the treasury have a power to exempt from its operation ships carrying passengers from Ireland to the British possessions in North America. The 5 and 6 Wm. IV., c. 53, contains further enactments of a like character. It also subjects the master to a penalty in cases of his improperly landing passengers at any place not contracted for, or wilfully delaying to sail, and provides for the maintenance of the passengers for 48 hours after their arrival at the destined port. The 4 Geo. IV., c. 88, regulates the carriage of passengers between Great Britain and Ireland. If a passenger fails to pay his fare, the master or owners have a lien on his luggage for the amount. Nothing is due for the conveyance of an infant born during the voyage. Where there is a contract for the conveyance of men or animals, in the absence of any stipulation to the contrary, freight will be due for those which die before the completion of the voyage. This may be provided against by a stipulation that the freight is to be paid for the conveyance and not for the lading of them. It is the duty of those who have contracted to convey, to do everything and be provided with everything necessary for the safe and expeditious accomplishment of the voyage; and if, through their failure to perform these duties, any damage results to the merchant, they will be answerable for it. At the commencement of the voyage the ship must be sea-worthy, tight, staunch, and sufficient, and properly equipped with all necessary tackle. The letter of the ship is not excused by his ignorance of any deficiency in these respects. The ship must also be provided with a master and crew competent to command and work her, and also with a pilot when necessary either from circumstances or from the law of the country. [Pilot.] After the goods are loaded, they must be properly guarded; if they are stolen while the ship is lying in some place within a country, the master and owners are responsible.

It is the duty of the master, unless in case of any usage which relieves him from such duty, to provide things necessary for the lading of the vessel and to stow away the goods so that they do not injure each other or suffer from the motion or leakage of the ship. The master must procure and keep all documents, papers, clearances, &c. required by the authorities in respect of the ship and cargo; and he must abstain from taking or keeping on board contraband goods or false papers. He must wait during the time appointed for loading the vessel, and, if required, also during that appointed for demurrage. He must pay the charges and duties to which the ship is subject. The statutes 3 and 4 Wm. IV., c. 52, and 1 and 2 Vic., c. 113, contain the enactments relative to what is necessary to be done in respect of the custom-house regulations by ships carrying goods from the United Kingdom beyond seas. When all things are prepared, the voyage must be commenced as soon as the weather is favourable. If the ship is to sail under convoy, she must sail first to the rendezvous assigned. Convoy means such ships of war as, in time of war, are appointed by the proper authorities to take charge of trading ships during their voyage to their respective destinations. Before sailing it is the duty of the master to obtain all the sailing orders and other necessary instructions which are issued by the commander of the convoy; and during the voyage to obey these and any others which may afterwards be issued, and to keep company with the convoy. During the time of war it is often rendered imperative upon merchant ships, by acts passed for that purpose, not to sail without the protection of convoy. After the commencement of the voyage, the master is bound, without delays, deviations, or stoppages, to sail direct to the port of destination. But stress of weather, the appearance of enemies or pirates, or the presence of any urgent necessity, will justify him in breaking through this rule; and he ought to do so for the purpose of succouring another ship which he finds in imminent peril or distress.

If the ship is lost or the goods injured during a deviation without any of these grounds of justification, the owner and master will be answerable for the loss to the merchant, even if it does not appear to have been a necessary consequence of the deviation. If the ship during the voyage is so damaged that she is unable to proceed without repairs, the master may detain the cargo, if not of a perishable character, till the repairs are made. If the cargo is of a perishable kind, he ought to tranship or sell it as may appear the most beneficial course. He may also in all cases, where the circumstances require it, exercise a discretion as to transhipping the cargo; as, for instance, when the ship is wrecked or in imminent danger.

Hypothecation of a cargo, like hypothecation of a ship, is 'a pledge without immediate change of possession.' The party to whom the goods are hypothecated immediately acquires a right to have possession of them if the money advanced is not paid at the time agreed on. This power of the master under circumstances of urgent necessity to sell or hypothecate the goods must be exercised with great circumspection; and the exercise of it can only be justified when it is consistent with what would have been the conduct of a discreet and able man under the circumstances. Where goods have been hypothecated, the merchant is entitled, on the arrival of the ship at its destination, to receive at his option either the sum for which they were hypothecated, or their market price at that place. During the voyage the master is bound to take every possible care of the cargo, and to do all things necessary for its preservation, and he and the owners will be answerable for all damage which might have been avoided by the exercise of skill, attention, and forethought. When the voyage is completed, the master must see that the ship is properly moored, and all things done relative to her which are required by the law or usages of the country. The statute 3 & 4 Wm. IV., c. 52, contains the regulations relative to customs to which it is necessary to conform in this country. Upon payment of freight and the production of bills of lading, the cargo must be without delay delivered to the parties entitled to receive it. In the case of a general ship, the usage often prevails for the master, before delivery, to take security from the merchants that they will pay their share of average after it shall have been adjusted. If the freight due on any goods is not ready to be paid, the master may detain the goods or any part of them. The goods may be detained either on board the ship or in any other safe place.

When the master is compelled, by an act of parliament, to land the goods at any particular wharf, he does not thereby part with the possession of the goods, and consequently does not lose whatever right he may have to detain them. If goods are sold by the custom-house officers before the freight is paid, the master is entitled to receive the first proceeds of the sale in discharge of the freight. In foreign countries, where any accidents have occurred to frustrate or interfere with the objects of the voyage, or any one of the parties to the contract feels himself aggrieved by the conduct of any other, it is customary to draw up a narrative of the circumstances before a public notary. This narrative is called a protest, and in foreign courts is admissible in evidence, even, as it would seem, on behalf of the parties by whom it is made. In our courts it is not admissible on their behalf, but is evidence against them.

Certain circumstances operate as an excuse to the master and owners for non-fulfilment of their contract 'The act of God' is understood to mean those accidents over which man has no control, such as 'lightning, earthquake, and tempest.' The 'perils of the sea,' interpreted strictly, apply only to the dangers caused merely by the elements, but these words have received a wider application, and in litigated cases the jury, after hearing evidence as to the usage which prevails among merchants, will determine what interpretation has been intended to be given to them. In the exercise of this discretion, juries have determined that the taking of ships by pirates is a consequence of the perils of the sea; and the verdict has been the same where the loss was caused by collision of two ships without any fault being attributable to those who navigated either of them; and also where the accident was caused wholly by the fault of those on board another ship. But all cases in which the loss happens by natural causes are not to be considered as arising from the perils of the sea. If the ship is placed in a dangerous situation by the carelessness or unskilfulness of the master, and is in consequence lost, this is not a loss from the perils of the sea, although the violence of the elements may have been the immediate cause of it. If a ship is reasonably sufficient for the purposes of the voyage, the master will not be liable for a loss arising from the perils of the sea, because a ship might have been built strong enough to resist them. By the 26 Geo. III., c. 86, owners are relieved from losses proceeding from fire, and also from the robbery, theft, or embezzlement of 'gold, silver, diamonds, watches, jewels, or precious stones,' unless at the time of shipping them their quality and value are made known in writing to the master or owners. The 'restraint of princes and rulers' is understood to mean a really existing restraint, not one which is anticipated, however reasonably or honestly. By the civil law, and also by the antient common law of England, the owners, in case of their being liable for any loss to the shippers, were responsible to its full amount. By the laws however of most nations their responsibility is now limited to the value of the ship and freight. The first statute which was passed on the subject was 7 Geo. II., c. 15, which was followed by the 26 Geo. III., c. 86, and the 53 Geo. III., c. 159 supplied some deficiencies in the former statute, limiting the responsibility still further than the first statute had done. The last statute applies only to registered ships, and as to them may be considered as containing almost all the law upon the subject. By this Act the responsibility is limited to the value of the ship and freight. It contains also provisions for the distribution, by means of an application to a Court of Equity, of the recompense owing the several parties entitled, where more than one claim, and directions as to the mode of calculating the value of the ship and freight. It does not extend to vessels employed solely in inland navigation, and none of the acts apply to lighters or gabbets. In cases where ships receive injury from collision with each other, the maritime law, which is acted on in the Court of Admiralty, differs in one respect from the law of England. Where the collision has occurred without any fault on either side, as for instance, from a tempest, each party must bear the injury which he has sustained. Where it happens wholly from the fault of one ship only, her owners are liable, as far as the value of the ship and freight, to which, by 53 Geo. III., c. 159, their liability is limited, for the amount of injury caused by their own conduct. Thus far the laws are in accordance with each other. If the collision has been caused by the faults of both ships, then, according to the law of England, each party must sustain his own loss. But by the maritime law the loss occasioned is after computation divided equally, and the owners of each ship sustain half. It is impossible to lay down any rule by which to ascertain on all occasions which ship is to be considered in fault. But it may be stated generally that steamers and ships which have the wind free, are bound to take proper measures to get out of the way of a vessel which is close hauled, as they are considered to be more completely under command; and that in the case of ships meeting each other, that which is on the starboard tack should keep her course, the one on the larboard should bear up.

But the failure to observe these rules by one ship will not justify the other in the neglect of any reasonable exertion or precaution by which the collision might have been avoided. By 1 & 2 Geo. IV., c. 76, s. 52, where damage has been done by a foreign ship, a judge has power to order the ship to be arrested, until the master, owner, or consignee undertake to become defendant in any action for the damage, and give security for the damages and costs sought to be recovered.

The merchant must use the ship only for lawful purposes, and not do anything for which it may be forfeited or detained, or the owners made liable for penalties. In case of any violation of the agreement, by employment of the ship for purposes other than those contemplated, or failure to perform the terms as to lading, &c., the amount of compensation, in case of dispute, is determined, as the circumstances of the case may require, by a jury. The words primage and average, which appear in the bill of lading, mean, the first, a small sum paid to the master; the second, as there used, certain charges, varying according to the usage of different places, for towing, beaconage, &c.

When an agreement for conveyance is expressed in the general form, or when there is no actual agreement, but only one implied by law from the circumstances of the case, there results from it a duty upon the master and owners, firstly, to deliver the goods at the place of destination, whether the ship is hired by the voyage or by the month. It is only by the entire performance of this duty that they can entitle themselves to the payment of freight. The parties may however so express the contract that the payment of all or part of the freight may be made before or during the course of the voyage. Although perhaps in such case the word freight is used in a sense which does not properly belong to it; strictly speaking it means only money accruing for the conveyance of goods in consequence of their delivery at the place of their destination. Where a provision is made by the contract for payment of freight at the place of shipment, the question has arisen whether the meaning of the parties was that the sum should be paid at all events on delivery of the goods on board, whatever might afterwards befall them; or whether it was merely to [illegible] out the place of payment in case the freight should become due by reason of the arrival of the goods at the port of destination. In all such cases the intention of the parties must be interpreted by the jury from the words and circumstances of the contract, and the usages of the place where it was made. The same observation will apply to cases where money has been advanced by the merchant, and it is disputed whether the money is to be considered as a loan or part payment of the freight. The owners will not lose their right to freight by a mere interruption or suspension of the voyage not caused by their own fault, as by capture and recapture, if the goods be ultimately delivered at the place of destination. Where the contract of conveyance is by charter-party, under which the merchant has agreed to pay a certain sum for the whole or the principal part of a ship, that sum will be payable even although he has not supplied enough for a full lading. If he has undertaken to furnish a full cargo, and to pay a certain sum per ton or per bale, he will in like manner under similar circumstances be bound to pay for as many tons or bales as the ship, or part hired, was capable of containing, even although he has not been able to put on board any lading at all; provided the ship has thereby been forced to come home without cargo, and this has not been caused by the fault of the master or owners. In case of an action against him for such a failure of his agreement, the jury will ascertain what, under all the circumstances, is a proper compensation to the owners, allowing for the profit of the conveyance of any other goods which may have been laden by other parties. If, under a contract to furnish a full cargo, the freight to be paid for per ton, &c., the merchant is ready to furnish a full cargo, and he is prevented from doing so by the master, the merchant is still liable to pay for the cargo conveyed, and his remedy for the injury which he has suffered by such prevention is by an action on the agreement against the master or owners. Where the freight is to be paid at so much a month, a calendar month is to be understood as meant. Where, from the terms of the agreement, the master has a right to refuse the delivery of the goods until the freight is paid, he is not bound to do so; and if he chooses to deliver the goods to the consignee or holder of the bill of lading, &c., and cannot afterwards get the freight from them, the merchant who chartered the ship is not released from his liability to pay the freight. If however under such circumstances the master does not insist upon payment of the freight in cash, but voluntarily and for his own convenience takes a bill of exchange in payment, the merchant-charterer is thereby discharged, and the owners will have no claim upon him in case the bill is not paid. But if he takes the bill simply because he cannot get payment in cash, the merchant-charterer still remains liable. Payment of freight by the charterer to the owners at their request is an answer to a demand by the master, unless the agreement has been made under seal between the charterer and the master; and even in that case a court of equity would interfere to relieve the charterer from a subsequent demand by the master. A purchaser of goods, by the transfer to him of a bill of lading which contains a contract for delivery of the goods to the consignees or their assigns on payment of freight, is liable for the freight. But the mere receipt of the goods alone will not bind the receiver to pay the freight, especially if there be an express agreement under seal for the payment of freight between the charterer and the master or owners. The Court of Admiralty, where a question of freight arises before it in the case of captured vessels, will make an equitable arrangement between the owners and merchant. Where two nations are at war, and goods belonging to a subject of one of them, on board a neutral ship, are captured by the enemy, the goods become lawful prize, and the captors, so representing the original owners, are bound to pay the full freight for them. The full freight is due, since it is by reason of the act of the captors that the goods have not reached their destination. On the other hand, if the goods of a neutral are captured on board a hostile ship, and the captors convey the goods to their destination, they are entitled to freight. But no freight is payable where the goods on board a neutral ship consist of warlike stores, or where the neutral ship was engaged in a traffic not open to the neutral nation in time of peace. Freight is not recoverable where the voyage from any cause is illegal. If the goods which have been laden are duly delivered, the owners will not be deprived of their right to freight simply because the goods have been damaged during the voyage; but if this damage proceeds from any improper act or omission by the master or owners, they will be liable to make recompense to the merchant. The merchant in this country seems to have no right to abandon the goods in lieu of paying freight, if, although the ship did not arrive, they have been conveyed by other means to the place of destination, and if no charge save that of freight is claimed upon them. But if the ship has been wrecked, and the goods are saved, and afterwards conveyed to the place of their destination, the merchant may abandon them, and is not bound to pay the freight if any expense of salvage has been incurred. If, in the case of a general ship, or where, though a ship is chartered, the hire for her is to be paid at so much per ton, &c., the merchant is bound to pay the freight of such goods as may be delivered, even though they form a part only of the whole cargo. Where the whole or principal part of the ship is let to the charterer without reference to the quantity of goods to be laden, and a part of the goods are afterwards lost by perils of the sea, it seems to have been held that no freight will be due for the remainder.

There is some doubt however whether this authority would be followed unless such a conclusion arose from the construction of the agreement between the parties. If the ship, without any fault in the master or owners, becomes unable to complete her voyage, and the merchant receives the goods at some other place than the place of destination, he is bound, according to the maritime law, to pay freight for the portion of the voyage which has been performed. The principle which establishes the owner's right under such circumstances to freight for a portion of the voyage has been admitted in the courts of common law in this country, but that right 'must arise out of some new contract between the master and the merchant, either expressly made or to be inferred from their conduct.' In the latter case, there being no direct means of ascertaining the intentions of the parties, they must be collected from the circumstances of the case considered with reference to the general principle which obtains in the maritime law. In doing this it is obvious that the degree of benefit derived to the merchant must be taken into calculation, as well as the amount of time, labour, and expense bestowed by the owner; and therefore when it is said that freight is to be paid according to the portion of the voyage performed, it must not be understood that time and space are the only measures for ascertaining the portion of the freight payable.

If the master unnecessarily sell the goods, and so prevent both himself from earning the whole freight, and the merchant from accepting the goods, the merchant is entitled to the entire produce of his goods without any allowance for freight. Where a portion of the voyage only has been performed, the merchant cannot be inferred to have contracted to pay freight for that portion unless he has accepted the goods at the place short of their destination. The principles upon which the Court of Admiralty, which possesses an authority over the ship and cargo, proceeds, differ from those of courts of common law. That court exercises an equitable jurisdiction; and where no contract has either been made or can be implied, applicable to the existing circumstances, 'considers itself bound to provide, as well as it can, for that relation of interests which has unexpectedly taken place, under a state of facts out of the contemplation of the contracting parties.' (Lord Stowell, in the case of the Friends v. Creighton, 1 Edw., *Ad. Rep.*, 246.) If the ship has actually never commenced the voyage, the owners are not entitled to any payment whatever, although they may have incurred great expences in lading her, and though her failure to commence the voyage is not attributable to any neglect or misconduct of theirs. Where the contract of hiring is for a voyage out and home, at so much to be paid monthly, &c. during the time the ship is employed, if by the terms of the contract the whole forms one entire voyage, no freight is due, unless the ship returns home, even though she may have delivered her cargo at the outport. But if the voyages out and home are distinct, freight will be earned on the delivery of the cargo at the outport.

If any part of the ship or furniture, or of the goods, is sacrificed for the sake of saving the rest, all parties interested must contribute towards the loss. This contribution is properly called 'Average.' It is sometimes called general average, in opposition to special or particular average, which is the contribution towards any kind of partial damage or loss, or gross average, in opposition to petty average, which is the contribution mentioned in the bill of lading towards the sums paid for beaconage, towage, &c.

The principle of average is recognised in the maritime law of all nations. It was introduced into the civil law from the law of Rhodes (*Dig.* 14, tit. 2, 'Lex Rhodia de Jactu;' and the Commentary of Peckius, 'In tit. *Dig. et Cod.* "Ad Rem Nauticam pertinentes" '). In order to constitute such a loss as is the subject of average, it must be incurred by design: the masts must be cut away, or the goods thrown overboard; and this must be done for the sake of saving the rest, as in the case of throwing goods overboard to keep the vessel from sinking or striking on a rock, or to lighten her that she may escape from an enemy, or of cutting away a mast or a cable to escape the perils of a storm. The necessary consequences of these acts are also the subjects of average; as where, in order to throw some goods overboard, others or some parts of the ship are damaged; or where it becomes necessary, in order to avoid the danger or repair the injuries caused by a storm or the enemy, to take goods out of the ship, and they are in consequence lost. The expenses also incurred in these operations are equally the subject of average. But the injuries incurred by a ship during an engagement with the enemy, or from the elements in consequence of measures taken to escape from an enemy, are not of such a nature as to fall within the definition. If goods are laden on deck, no average is recoverable in respect of the loss occasioned by throwing them overboard, unless by the usage of trade such goods are usually so laden. If a ship is voluntarily stranded for the purpose of saving her and the goods, and afterwards gets off safely, the expenses incurred by the stranding are the subject of general contribution; but if the ship be wrecked in consequence of the voluntary stranding, the wrecking, not being voluntary, is therefore not such a loss as calls for a general contribution. If, in consequence of such an injury done to a ship as would be the subject of average, she is compelled to go into port to repair, the necessary expenses incurred in refitting her, so as to enable her to prosecute her voyage, and the amount of wages, port dues, and provisions expended to accomplish that object, are also the subject of average; and, if the master is unable to obtain the money necessary by any other means than by the sale of a part of the cargo, the loss caused to the merchant upon such sale is also the subject of average. If, in consequence of the sacrifice made, the ship escape the danger which immediately threatens her, but is afterwards wrecked or captured, and the remaining goods, or part of them, are saved or recaptured, these are bound to contribute average towards the loss in the first instance incurred, in proportion to their net value in the hands of the merchant after all expenses of salvage, &c. have been paid.

The things upon which average is payable are, the ship, boats, furniture, &c., but not provisions or ammunition; also all merchandise, to whomsoever belonging, which is on board for the purposes of traffic, but not the covering, apparel, jewels, &c. of parties on board for their own private use. The freight due at the end of the voyage is also subject to average. The goods are to be valued at the price for which they would have sold at the place of destination. If the ship, by reason of what happened when the average was incurred, return to her port of lading, and the average is there settled, the goods are to be valued at the invoice price. The losses incurred by the ship and furniture, &c. are calculated at two-thirds of the price of the new articles rendered necessary to be purchased. The usages of other countries as to all matters connected with average differ in some respects both from those of each other and those of this country. Where the average has been adjusted according to the established law and usage of the country in which the adjustment was made, it is binding upon all the parties to it, unless there be some special contract between them which provides otherwise.

Salvage is that reasonable compensation which persons are entitled to receive who save a ship or her cargo from loss by peril of the sea, which may be called civil salvage, or recover them after capture, which may be called hostile salvage. By the law of England no fixed amount of salvage is laid down as applicable to all cases. What is reasonable can only be determined by a reference to the circumstances. Sir J. Nichol (3 Hag., *Ad. Rep.*, 117) defines the ingredients in estimating a civil salvage service to be, '1st, enterprise in the salvors in going out in tempestuous weather to assist a vessel in distress, risking their own lives to save their fellow-creatures, and to rescue the property of their fellow-subjects; 2nd, the degree of danger and distress from which the property is rescued, whether it was in imminent peril, and almost certainly lost if not at the time rescued and preserved; 3rd, the degree of labour and skill which the salvors incur and display, and the time occupied; lastly, the value.'

Unless in cases where the services have been trifling, the salvage is generally not less than a third, and not more than one-half of the property saved. If the parties cannot agree as to the amount, the salvors may retain the property until compensation is made; or they may bring an action, or commence a suit in the Admiralty Court, against the proprietors for the amount. In case the property is retained, the proprietors may, upon tender of what they think sufficient, demand it, and, if it is refused, bring an action to recover it, in which action the jury will determine as to the amount due. The costs of the action will be paid by the salvor or the proprietors according as the amount tendered is or is not determined to be sufficient. The Court of Admiralty has jurisdiction in those cases only where the salvage has been effected at sea or within high and low water mark. A passenger is not entitled to salvage for his assistance during the time he is unable to quit the ship. But, if he remain voluntarily on board, he may recover salvage for the assistance which he has given. On one occasion where a passenger under such circumstances, after the desertion of the master and part of the seamen, assumed the command with the consent of the mate and the remainder, and brought the ship safe into port, he obtained a large sum as salvage. A distinct contract for assistance will do away with any claims for salvage on behalf of the parties who render it. Though a king's ship is bound to assist a merchant ship in distress, it still has a claim for recompense. In awarding salvage, no claims are allowed which are founded on merely prerogative rights, as those of the lord-high-admiral, flag-officers, magistrates, &c.: those claims only are allowed which are made in respect of assistance rendered. The saving of human life cannot of itself be the subject of a claim for salvage, but if it is connected with the preservation of property, that is a circumstance which may affect the amount of salvage. If freight is in progress of being earned, and afterwards does become due, salvage is payable in respect of freight also. When proceedings for salvage have been commenced in the Admiralty Court, the defendants may tender by act of the court any sum which they consider sufficient, and the court will then enter upon an inquiry, and determine as they think fit. If the sum tendered has been sufficient, the court may hold the salvors liable to the expenses of the proceeding. Several statutes have been passed providing for what is to be done in case of ships in distress, and for the purpose of regulating and facilitating the adjustment of demands of salvage. The 12 Anne, c. 18, s. 2, applies to cases where the assistance has been rendered by the persons mentioned in that act. The 26 Geo. II., c. 19, provides for the case of persons voluntarily rendering assistance. The 48 Geo. III., c. 130, and 1 and 2 Geo. IV., c. 76, are applicable to cases where assistance is given at the request of persons belonging to the ship. The statutes 53 Geo. III., c. 87, and 1 and 2 Geo. IV., c. 75, contain some enactments relative to the same subject. None of these acts apply to the Cinque-Ports. Upon application by the principal officer of a ship which is stranded or in danger of being so, the sheriffs, magistrates, and officers of the customs and other persons mentioned in the acts are bound to order the constables to call together persons and go to her assistance; and if any other ship is near, the officers of the customs or constables are required to demand assistance by men and boats from her chief officer, who is liable to forfeit 100*l.* to the chief officer of the ship in distress if he does not give assistance. All the persons employed are to be subject to the command of the master or other officers or owners of the ship which is in distress, and in case of their absence, the acts name a number of persons, beginning with the officer of customs, whom, in order according as they happen to be present, all persons are to obey. The power of the county (*posse comitatus*) may, if needful, be summoned by the sheriff, or in his absence by any magistrate, to enforce the execution of the statutes, and the person in command is authorised to use force if necessary to repel persons who improperly obtrude themselves. An account of the names of the ship, master, and owners, &c., of the cargo, &c., and of the circumstances of the distress, is to be taken by the officer of the customs on oath of the parties cognizant of the circumstances before a magistrate. This account is to be forwarded to the secretary of the Admiralty, and by him published in the next London Gazette. The persons who assist are to be paid by the master, seamen, or owners, a reasonable reward within thirty days; and if this is not paid, the ship or goods remain as a security in the hands of the officer of the customs. In case of disagreement as to amount, the nearest magistrate is to call a meeting of magistrates and some other officers named, who, or any five of them, are empowered to examine witnesses on oath and to determine the amount of salvage. Provision is made for cases where no owner of the property appears. Perishable goods may be sold. No lord of a manor claiming a title to wreck can appropriate it until an account in writing, of the property, and of the place where it was found and it has been since deposited, has been sent to the vice-admiral or his agent, or, if none such reside within 50 miles, then to the Trinity-house, and a year and a day has elapsed after the delivery of the account. It is the duty of the vice-admiral or his agent to forward it to the secretary of the Trinity-house, who is bound to place it in some conspicuous situation. A variety of analogous provisions are enacted relative to goods, parts of ship's furniture, &c. which are found or recovered, whether they may have belonged to ships in distress or not. The statutes which relate to the Cinque-Ports are, 49 Geo. III., c. 122, s. 14; 1 and 2 Geo. IV., c. 75, s. 13; and 1 and 2 Geo. IV., c. 76.

In case of capture, by the antient maritime law the ship and goods became the absolute property of the captor. The old practice in this country was, when ships were in pay of the king, to divide in certain proportions, which varied at different times, the value of the capture between the king, the owners, and the captors. Where the capture was made by ships not in the king's pay, he received no share, but a small proportion was paid to the admiral. In the reign of George II. provision was for the first time made by various statutes for the restoration of the recaptured ship and cargo to the owners, and the rates of salvage were fixed, varying according to the length of time that had elapsed since the capture. In the reign of George III. these rates were done away with, and by various acts the rate of salvage was fixed at one-eighth of the value in the case of king's ships, and one-sixth for private ships; where the re-capture was effected by the joint operation of king's and private ships, the Court of Admiralty were to order such salvage as was reasonable. Convoying ships are entitled to salvage for the recapture of ships which accompanied them. A ship, which has once been used as a ship of war, is not subject to be restored if afterwards recaptured. If a ship is deserted by the enemy after capture and subsequently taken possession of, this is not a recapture, but those who take possession are entitled to recompense as in an ordinary case of salvage. If after the recapture the ship is again taken and condemned, the right of salvage is extinguished. Where the ship of a power in alliance with Great Britain is taken by the common enemy and afterwards recaptured by a British ship, the rule for restitution on payment of salvage is the same as in the case of the capture of a British ship; provided the allied power chooses to adopt that rule in reciprocal cases. If it does not, the same rule which is acted upon in the courts of the allied power is adopted in the British courts. If the ship of a neutral nation be taken as prize by an enemy of Great Britain and be retaken by British subjects, it is restored to the owners without salvage, unless there is reason to suppose that under the circumstances the ship would have been condemned in the courts of the capturing nation. Where it appears that such would have been the case, the British subjects are entitled to salvage. Ships and merchandise taken from pirates are subject, by 6 Geo. IV., c. 49, to a payment of one-eighth of the value. [PRIZE.]

4. *As to the Employment and Wages, &c. of Merchant-Seamen.*—Their contracts may be divided into two classes, those under which they are paid a certain sum per month, and those under which they are to receive a sum in gross for the whole voyage.

Many Acts have been passed to regulate the hiring of seamen, but they were repealed by the 5 & 6 Wm. IV., c. 19, which contains all the law on the subject. It is unlawful for any master of a British ship trading to parts beyond seas, or above the burden of eighty tons, engaged in the fisheries, coast-trade, &c., to take to sea any person (except apprentices) as one of his crew, without first entering into a written agreement with him; and the master is liable to a penalty of 10*l.* for every seaman taken to sea without entering into an agreement. The agreement must specify what wages he is to receive, the nature of his employment, and of the voyage contemplated. The voyage must be distinctly explained; where one place is mentioned, followed by the words, 'or elsewhere,' the latter words are not to be taken literally as meaning any other part of the globe, they must be confined to places having some degree of proximity or relationship to the place named. It must be dated in the month and year when it is made; the master must sign it in the first instance, and the seaman at the port where he is shipped, and before the seaman signs, it must, on pain of forfeiture of 5*l* by the master, be read over to him distinctly in the presence of the person who is to attest the seaman's signature. The form of the agreement is prescribed by the statute. The engagement of the seaman is, to serve on board the ship; to conduct himself in an orderly, faithful, honest, careful, and sober manner; to be diligent in his duty, and obedient to the lawful commands of the master in everything relating to the ship and her materials, stores, and cargo, whether on board, in boat, or on shore. This agreement is called the ship's articles. By s. 5 of the Act no clause in the agreement whereby a seaman shall consent to forego the right, which the maritime law gives him, to wages in the case of freight earned by ships subsequently lost, or containing words to that effect, shall be binding on the seaman. If a seaman neglect or refuse to join his ship, or absent himself without leave, he may on complaint on oath by the master, mate, or owner, be apprehended and brought before a magistrate, who is authorised, if his conduct is not satisfactorily explained, to commit him to hard labour in the house of correction for thirty days; or, if he is willing to join the ship, the magistrate may, at the request of the master, order him to be conveyed on board, or delivered to the master, and award costs not exceeding forty shillings to the master, to be deducted from the wages. Persons who, with a knowledge of the fact, harbour a seaman who has so absented himself, are liable to a penalty of 10*l.* No debt incurred by a seaman after signing of the agreement, above 5*s.*, is recoverable until after the end of the voyage; and if any of the effects of the seaman are detained by a publican or lodging-house keeper for such debt, any magistrate is authorised to issue a warrant for their seizure and delivery to the seaman.

The act contains regulations relative to the preservation of the seaman's health, his protection in case of sickness or accident, and his proper treatment at home and abroad. The master and owners must deposit a copy of the agreement with the collector of the customs at the ship's port, and at the place of her destination on her arrival from abroad, on pain of forfeiting 50*l.* When a seaman is discharged, he is entitled to a certificate signed by the master of his service and discharge, specifying the period of his service and the time and place of his discharge. If without reasonable cause the master refuse such certificate, he is liable to forfeit 5*l.* to the seaman. If a ship is sold in a foreign country, except in cases of wreck and condemnation, the master is bound to pay the seamen their wages under the agreement, and to find them employment on board a British vessel homeward bound, or to send them to the port in the British dominions whence they started, or some other port which is agreed on. If he neglect to do so, and the consul or other persons named in the Act defray the necessary expenses, they may be recovered from the owner. But the master may be relieved from this necessity by the consent of the seamen, in writing, to be discharged, given in the presence of the consul, or, where there is no consul, of one or more British resident merchants.

A master is prohibited from discharging or leaving behind any of his crew at any place in the British colonies, without the sanction, in writing, of the governor or other officer appointed for that purpose, or at any place abroad without a similar sanction from the consul; or, where there is no consul, of two respectable resident merchants. Every ship is bound to have on board a sufficient stock of medicines, and the owner or master must at their own expense furnish the necessary medicines and attendance upon any of the crew who is injured in the ship's service, until the seaman is cured, or the ship return to the United Kingdom. The Act also contains provisions relative to the binding and management of apprentices.

A verbal agreement for wages is not invalid, but if a written one is in existence, no remuneration not expressed in the written agreement can be recovered.

The performance of any promise to give gratuities or extra pay in reward of extraordinary exertions made in time of distress, or by reason of the desertion or death of others of the crew, cannot be enforced.

As soon as by performance of the voyage and delivery of the cargo at the port of discharge the owner has become entitled to freight, the seaman becomes entitled to wages, and hence the meaning of the phrase that freight is the mother of wages. What is to be considered the port of discharge must be determined by a reasonable construction of the statements made in the articles. The seaman is not the less entitled to his wages although he may have been disabled by sickness or any bodily injury, provided the injury was received in the discharge of his duty. If he be prevented from fulfilling his contract by any wrongful act of the master, he will still be entitled to his wages. When a vessel is detained by an embargo, a seaman hired by the month is entitled to receive wages during the embargo. If a seaman is impressed on board a king's ship, he does not therefore lose his wages; his title to them however still remains dependent on the arrival of the ship. The 5 & 6 Geo. IV., c. 19, contains various provisions relative to the payment of wages for the portion of time during which the seaman has served. Upon being impressed, he is entitled to receive a bill from the master payable on the arrival of the ship; and where the wages cannot be computed, to a certificate of the time, &c. during which he has served, and the master receives from the officer of the king's ship a certificate of the entry of the seaman. Where a seaman dies during the period of his service, his representatives will be entitled to wages if the hiring was a monthly one; but where the hiring is for the whole voyage, and no usage exists from which a contrary agreement can be inferred, it appears that nothing is due for the partial service. By 4 & 5 Wm. IV., c. 52, the wages earned by a seaman who has died during the voyage are to be paid, within three months after the arrival of the ship, to the trustees for the port appointed under that Act, or where there are no trustees, to the president of the Corporation for the Support of Maimed Seamen, or for the use of the representatives of the deceased. There are various provisions for the payment to the widow or next of kin; in case no such persons make claim during three years, the money at the end of that period is to be applied to the institution. If after seamen are hired the owners determine not to send the ship on her voyage, the seamen are entitled to wages during the time that they have been employed, and may also recover a compensation for any special loss which they may have sustained in consequence of the ship not sailing. The 5 & 6 Wm. IV., c. 19, also regulates the payment of wages. In ships employed on the coast, wages are to be paid, if demanded, within two days after the determination of the agreement, or the seaman's discharge, whichever first happens; and in all other cases within three days after the delivery of the cargo, or ten days after the seaman's discharge. This enactment does not apply to cases where a seaman is paid, as in the whale-trade, by a share in the adventure. If a seaman is left abroad from sickness, the master is to pay the seaman there, either by money or a bill drawn on the owners, and to give an account of the wages to persons on the spot, as perscribed by the Act.

If after wreck or capture part of the cargo is saved, and the owners become entitled to freight for so much, the seaman is entitled to the same proportion of his wages. If after a vessel is stranded the seamen remain together, and by their exertions save any parts of the wreck, they are entitled upon the parts saved, as far as they will go in satisfaction of their wages. If a ship is condemned for illegal trading to which the seamen are no parties, they do not forfeit their right to wages. Where there are distinct ports of delivery during a voyage, the right to wages for so much attaches upon the delivery at each port, and the seaman will not be divested of this right by the subsequent loss of the ship; but if a ship sail to one place merely to take in cargo there, and, after taking in, is lost before arrival at the delivering port, the seaman is not entitled to wages for navigating the ship even to the place where the cargo was taken in. If a ship is recaptured, and arrives at her place of destination, the seamen are entitled to wages, subject perhaps to a proportionate deduction for salvage. A forfeiture of all wages previously earned is a consequence of desertion from the ship in all maritime codes; and the 11 & 12 Wm. III., c. 7, contains provisions to the same effect. Where the leaving of the ship does not amount to absolute desertion, it is enacted by 5 & 6 Wm. IV., c. 19, that any seaman who without leave wilfully absents himself from duty shall forfeit two days' pay for every twenty-four hours of absence, or, at the option of the master, the expenses which have been incurred by his absence; and there is the same provision as to cases where he neglects to perform his duty on board. If after arrival of the ship at the port of delivery the seaman quits her, before her cargo is delivered, without leave, he forfeits a month's wages, provided the absence or neglect is entered in the log, and substantiated, in case of dispute, by the mate or some other credible witness. In case of desertion, he forfeits not only all his wages, but also such of his effects as are left on board, provided the fact of the desertion is entered on the log, and certified by the signature of a credible witness. If by reason of the desertion it becomes necessary to employ a substitute at higher wages, the deserter is liable to pay the difference between his own wages and those of the substitute. If the seaman, after quitting the ship, is afterwards received and employed, that will amount to a waiver of the forfeiture. Wages may also be forfeited (22 & 23 Ch. II., c. 11) in case the seaman neglect or refuse to defend the ship against pirates; and if the seaman has been guilty of such acts as habitual disobedience, drunkenness, &c., which justifies his discharge, he will lose his title to wages.

The seaman may recover his wages by suit either in the common law courts or in the Admiralty courts. If in the former, his only remedy is against his debtor personally; if in the latter, he may proceed also against the ship itself. The Admiralty have only authority to 'meddle' with 'a thing done upon the sea.' (13 Ric. II., st. 2, c. 5; 15 Ric. II., c. 3.) Upon the strict construction of the words of the latter of these statutes, neither the master nor the seamen would be entitled to avail themselves of the process of the Admiralty Court, the claims of both being founded, as they usually are, upon a contract made on shore, or in a port within a county. The remedy of the master against the owners is confined to an action against them personally in the ordinary law courts; but the case of the seamen is considered to be excepted, and they have the advantage of being able to bring a suit, in which they all may join, in the Admiralty Court; and they can either arrest the ship, or proceed personally against the owners or the master. In a proceeding against the owners, the master may be a witness for the seamen. Foreign seamen may also proceed in that court for wages due under the general maritime law, but not for those the claim to which is founded on the law of some particular country. In the case of British seamen, if the contract be made by deed containing terms and conditions different from those resulting in contemplation of law from an ordinary service, the Court of Admiralty, which is considered as unfit to construe such instruments, ceases to have jurisdiction. But in order to deprive the Court of Admiralty of its jurisdiction, the defendants ought to show that the special contract is in existence. If the court does not allow the plea, and cease to entertain the case, the Court of Queen's Bench will grant a prohibition. [PROHIBITION.] Where the ship itself is proceeded against, the claims of the seamen for wages take precedence of all others. Proceedings in this court are subject to the same limitation of six years which applies to other actions. When the action is brought in an ordinary court of law, it is conducted according to the rules of those courts; but the master or owners of the ship are in all cases of proceedings for wages bound to produce the contract on which the claim is founded. Where the amount of wages claimed does not exceed 20*l*., the statute 5 & 6 Wm. IV., c. 19, gives a summary jurisdiction to magistrates residing near the port where the ship ends her voyage or delivers her cargo, to entertain the claim, and enforce the payment of it by distress and sale of the goods of the party proceeded against, or by levy upon the ship and furniture. If an action is brought in such cases, the plaintiff cannot recover costs of suit. (Abbott *On Shipping*.)

Marine Insurance.—The law of marine insurance constitutes an important part of the general law of shipping.

A maritime insurance is a contract by which one party, who is called the insurer, in consideration of a premium agreed upon, undertakes to make good to another, who is called the insured or assured, the loss or damage which may befal his ship or goods on their passage from one place to another. The instrument containing such a contract is called, in common with instruments for fire or life insurance, a policy. It is usually not under seal, unless the insurers are an incorporated company. Formerly the Royal Exchange Assurance Company and the London Assurance Company were the only companies for insuring ships, the legislature having given them a monopoly as against all except individual insurers. This monopoly has been abolished by 5 Geo IV., c. 114. A great proportion of the business connected with the shipping insurance of this country is transacted at Lloyd's Coffee-house at London. Insurers are commonly called underwriters, from the circumstance of their writing at the foot of the policy their names and the portion they are severally willing to take of the amount for which the merchant desires to insure. The form of policy usually adopted is of antient origin, and rather quaint and obscure in its phraseology, but most of its terms have acquired a certain meaning from judicial interpretation, and it is therefore found convenient to retain them.

The ordinary form is the following:—

'In the name of God, Amen.

'A. B., as well in his own name as for and in the name and names of all and every other person or persons to whom the same doth, may, or shall appertain, in part or in all, doth make assurance, and cause himself and them, and every of them, to be insured, *lost or not lost*, at and from ——— upon any kind of goods and merchandises, and also upon the body, tackle, apparel, ordnance, munition, artillery, boat, and other furniture, of and in the good ship or vessel, called the ———, whereof is master, under God, for this present voyage, C. D., or whosoever else shall go for master in the same ship, or by whatsoever other name or names the same ship, or the master thereof, is or shall be named or called; beginning the adventure upon the said goods and merchandises from the loading thereof aboard the said ship ——— and upon the said ship ———, and so shall continue and endure during her abode there, upon the said ship, &c. And further until the said ship, with all her ordnance, tackle, apparel, &c., and goods and merchandises whatsoever, shall be arrived at ———, upon the said ship, &c., until she hath moored at anchor twenty-four hours in good safety; and upon the goods and merchandises until the same be there discharged and safely landed. And it shall be lawful for the said ship, &c. in this voyage to proceed and sail to, and touch and stay at any ports or places whatsoever, without prejudice to this insurance. The said ship and goods and merchandises, for so much as concerns the assureds and assurers in this policy, are and *shall be valued at* ———.

'Touching the adventures and perils which we the assurers are contented to bear, and do take upon us in this voyage, they are of the seas, men-of-war, fire, enemies, pirates, rovers, thieves, *jettisons*, letters of mart and countermart, surprisals, taking at sea, arrests, restraints, and detainments of all kings, princes, and people, of what nation, condition, or quality whatsoever, *barratry* of the master and mariners, and of all other perils, losses, and misfortunes that have or shall come to the hurt, detriment, or damage of the said goods and merchandises, and ship, &c., or any part thereof. And, in case of any loss or misfortune, it shall be lawful to the assureds, their factors, servants, and assigns, to sue, labour, and travail for, in, and about the defence, safeguard, and recovery of the said goods and merchandises, and ship, &c., or any part thereof, without prejudice to this insurance; to the charges whereof we the assurers will contribute each one according to the rate and quantity of his sum herein assured. And it is agreed by us the insurers that this writing or policy of insurance shall be of as much force and effect as the surest writing or policy of assurance heretofore made in Lombard-street or in the Royal Exchange, or elsewhere in London. And so we the assurers are contented and do hereby promise and bind ourselves, each one for his own part, our heirs, executors, and goods, to the assureds, their executors, administrators, and assigns, for the true performance of the premises, confessing ourselves paid the consideration due unto us for this assurance by the assured ——— at and after the rate of ———. In witness whereof, we tne assurers have subscribed our names and sums assured in London.

'N.B. Corn, fish, salt, fruit, flour, and seed are warranted free from *average, unless general*, or the ship be stranded. Sugar, tobacco, hemp, flax, hides, and skins are warranted free from average under 5*l*. per cent. And all other goods, also of ship and freight, are warranted free from average under 3*l*. per cent., unless general, or the ship be stranded.'

The conditions of the policy may be varied according to the particular agreement between the parties.

The words in the policy, 'the said ship and goods and merchandises *shall be valued at*,' make this a 'valued policy;' that is, a policy which enables the merchant, in case of loss, to recover the stipulated amount without proof of the value of the things insured. A policy without words expressive of an agreement between the parties as to value, is called an open policy, and leaves the question of value open.

The subjects of marine insurance are, generally speaking, whatever is put in risk, as the ship, tackle, provisions, &c., cargo, freight, profits, and money lent at bottomry or respondentia. As for the purpose of stimulating the seaman to exert himself to the utmost for the safety of the ship, a rule has been established, that he is entitled to no wages unless the adventure be completed and the ship earn freight, so an insurance which would nullify that rule is declared illegal. A seaman therefore cannot insure his wages.

The subject matter of the insurance, whether the ship only, or goods, or freight, must be accurately described, and so must the voyage, and the times and places at which the risk is to begin and end.

The words '*lost or not lost*,' in the policy have the effect of rendering the underwriter liable, though the ship be lost before the insurance is entered into, provided the loss were not then known to the assured.

Perils of the sea signify losses occasioned by winds and waves, rocks, sands, &c. If the ship is run down, this is considered a peril of the sea. *Jettison* signifies the voluntary throwing of goods or of any part of the ship overboard for *any* justifiable reason, as either to prevent their falling into the hands of an enemy, or to save the rest of the cargo or the ship. *Barratry* denotes any sort of fraud in the master or seamen by which the owners of the ship or cargo are injured. Thus barratry may be committed by running away with the ship, by defeating or delaying the voyage with a criminal intent, or by doing any act to forfeit the insurance.

The loss or damage in every case is ascribed to the proximate cause. Where the ship is checked in her rate of sailing by sea-damage, and in consequence is overtaken by an enemy and captured, this is considered a loss by capture.

The memorandum at the foot of the policy is inserted to protect the underwriter from minute liability in respect of perishable articles, as to which it would often be difficult say whether the damage was occasioned by intrinsic or extrinsic causes, the indemnity of the underwriter extending to the latter description of causes only. 'Warranted *free from average, unless general*,' protects the underwriter from making good any damage, short of a total loss, to the excepted article. A damage to any specific article itself is called a particular average. *General average*, to which the exception in the memorandum of the policy does not extend, takes place where part of the ship, as the mast, or where part of the cargo, has been thrown overboard for the common benefit, in which case the owner of the property sacrificed is entitled to contribution from all others who have property embarked in the adventure. This contribution is called general average.

The policy will be vitiated by misrepresentation or concealment on the part of the assured of any fact material to a correct estimate of the risk; and the underwriter will be discharged from liability if the ship do not proceed on the same voyage with that described, or if there be any unnecessary stopping or deviation.

(Park, *On Marine Insurance*; M'Culloch's *Commercial Dictionary*, art. 'Marine Insurance.')

SHIPWRECK. [Asphyxia; Drowning; Life-Boat.]

SHIRAS. [Persia.]

SHIRAKOH (Lion of the Mountain), son of Shadi, and brother of Ayoob, the father of the famous Salah-ed-deen, a Kurd of the tribe of Ravendooz, commenced his career in the service of the Seljukian monarchs of Persia, and is first mentioned as holding a command in the garrison of Bagdad. Both the brothers however soon became adherents of Zenghi, the famous atabek of Syria, and continued attached to his illustrious son Noor-ed-deen, under whom they rose to high distinction. In A.D. 1159 (A.H. 554) the turbulent spirit of Shîrakoh had nearly led him into open revolt during a dangerous illness of the sultan; but he was restrained by the prudent admonitions of Ayoob, and the mention by Abul-Feda of his repairing to Mecca in the following year would appear to imply that he incurred temporary disgrace on the recovery of Noor-ed-deen. In 1163 he was however entrusted with the command of the force destined to reinstate the vizier Shawer [Shawer] in Egypt: but on that occasion, as well as in the second expedition of 1166, he was compelled to evacuate the country by the perfidy of his ally, who called in the Franks of Palestine to his aid. But his military reputation was established by the generalship and bravery displayed in these unsuccessful campaigns; and his *third* invasion (1168) established the power of Noor-ed-deen in Egypt. Amaury, king of Jerusalem, was compelled to raise the siege of Cairo: and Shîrakoh, after putting to death the perfidious Shawer, himself assumed supreme power under the title of Vizier to the Fatimite caliph Adhed, who conferred on him the title of Assad-ed-deen (Lion of the Faith). He died a few months afterwards, and was succeeded in his dignities by his nephew, the famous Salah-ed-deen.

Shîrakoh appears to have been one of the most consummate captains of his age and country; and to him was unquestionably due the foundation of the Ayoobite power, the fruits of which were reaped by his collateral relatives. His own descendants continued for four generations to occupy the petty principality of Hems or Emesa, under the suzeraînté of the sultans of Egypt and Syria, till they were deprived of it, in 1263, by the Mamluke Bibars.

SHIRE, from the Saxon *schyran*, to divide (whence also *to shear*), is the name of districts into which the whole of Great Britain is divided. The word shire is in most cases equivalent to *county*, a name often substituted for it in Great Britain, and always in Ireland. The origin of this distribution of the country cannot probably now be ascertained. It has been customary to attribute it to Alfred, upon the authority of a passage in Ingulphus, the monk of Croyland, who wrote about a century and a half after the reign of that king. Asser however, the biographer of Alfred, does not mention this most important fact; and, in truth, shires were certainly known before Alfred's time. Sir Francis Palgrave shows them to be identical, in many cases, with Saxon states; thus Kent, Sussex, Essex, Norfolk, Suffolk, Middlesex, and Surrey were antient kingdoms: Lincolnshire, under the name of Lindesse, was an independent state, and Worcestershire (*Huiccas*) was the jurisdiction of the bishop of Worcester. Another class of shires were formed out of larger divisions, either for the sake of more easy management when the population of the particular district had increased, or for the sake of giving territory to an earl. Yorkshire was part of the kingdom of Deira, and Derbyshire of Mercia. Lancashire was made a county subsequently to the Conquest. On the other hand, some shires have merged in others: Winchelcombeshire is a part of Gloucestershire; and in the recent act for abolishing the palatine jurisdiction of the bishop of Durham (6 and 7 William IV., c. 19, s. 1) no less than five shires are mentioned, viz. Craikshire, Bedlingtonshire, Norhamshire, Allertonshire, and Islandshire, which have long ceased to possess, if indeed they ever enjoyed, separate jurisdictions.

The uses of the division into shires may be learnt by an enumeration of the principal officers in each: 1, the lord lieutenant, to whom is entrusted its military array [Lord Lieutenant]; 2, the custos rotulorum, or keeper of the rolls or archives of the county, such as the county court rolls—this officer is appointed by letters-patent under the great seal, and is now always identical with the lord-lieutenant, except in counties of cities, where the high steward is usually custos rotulorum; 3, the sheriff, or, as he is often called, the high sheriff [Sheriff]; 4, the receiver-general of taxes, who is appointed by the crown, and accounts to it for the taxes levied within his district—he also receives the county rates, and disburses them as the magistrates in quarter sessions, or as any other competent authority, direct; 5, the coroner [Coroner]; 6, the justices of the peace, whose commission extends only to their own county, and who, assembled in sessions, have jurisdiction over many offences, and control over the county funds [Sessions]; 7, the under-sheriff, who is appointed by and performs nearly all the duties of sheriff; and 8, the clerk of the peace, an officer (almost always an attorney) appointed by the justices in quarter-sessions, whose duty it is to file and produce recognizances, returning them, when forfeited, to the sheriff to be levied [Recognizance]: he likewise prepares or files indictments to be tried at the sessions or assizes, and in general acts as the officer of the justices in quarter-sessions. To this list of officers may be added the knights of the shire, or representatives of the county in parliament.

County-rates are assessments made on the freeholders of the shire by the justices in quarter-sessions assembled, according to estimates laid before them. The principal objects of these rates are: the building and repair of bridges, gaols, shire-halls and courts of justice, and of late years lunatic asylums; the repair of certain roads; the payment of the salaries of the coroner, clerk of the peace, high and special constables, gaolers, &c.; the expense attending the apprehension, conveyance, and prosecution of persons accused of crime; and under this head is included the remuneration to witnesses for their loss of time and expenses; the maintenance of prisoners, and their transportation. The rates are levied by collectors, and enforced by the sheriff.

The judicial tribunals in each county are the assize court [Assizes]; the county-court, presided over by the sheriff, and, until magna charta, a court of record; the hundred courts, and courts-leet. [Courts.]

The principal subdivision in a county is the hundred, a district which in its origin bore relation rather to the population than to any uniform geographical limits. Mr. Hallam considers it to have been a district inhabited by 100 free families, and that a different system prevailed in the northern from that of the southern counties; in proof of which he contrasts Sussex, which contains 65 hundreds, and Dorsetshire, which contains 43, with Yorkshire, which contains only 26, and Lancashire, only 6. In the counties north of the Trent, and especially in Scotland, this subdivision is often called a wapentake. That the division into hundreds was known among the Germans, even in the time of the Roman invasion, is argued from two passages in Tacitus ('De Mor. Germ.,') 'ex omni juventute delectos ante aciem locant—Definitur et numerus; *centeni* ex singulis pagis sunt.' And again, 'Centeni singulis (principibus) adsunt ex plebe comites, consilium simul et auctoritas.' 'Nihil nisi armati agunt;' and hence Spelman infers the identity of the *wapentach*, or military array (taking of weapons) and the hundred court. Sir Francis Palgrave says that the burgh was only the enclosed and fortified resort, the stockade of the inhabitants of the hundred. The subdivision of the hundred was the tithing, composed, as it is alleged, of ten free families, and having for an officer the tithing-man, a head constable.

Whether in the barbarous times to which it is attributed, so elaborate a system as we have sketched could have prevailed, is at least most doubtful; but the theory is that somewhere about the time of Edgar (A.D. 950), the county was divided into tithings, of which twelve made a hundred—for the Saxon hundred meant 120, and hence perhaps the frequent use of the number 12 in our legal processes. These hundreds were presided over by their decanus, or headborough, or hundred-man, and were represented in the shiremote; and this aggregate body, the shire, presided over by its earl and bishop or sheriff, conducted its own internal affairs.

There are three counties-palatine, the earl of which had within his shire all the fiscal and judicial powers of the crown:—Chester, created by William the Conqueror; the duchy of Lancaster, created by Edward III.—these two have been long annexed to the crown; and Durham, heretofore governed by the bishop, but annexed to the crown by statute in 1836. In the latter year, a part of the see of Ely, which had been a royal franchise, was annexed to the crown, as Hexhamshire in Northumberland had been in the reign of Elizabeth.

For an enumeration of the English and Scottish counties, see Great Britain; and for the Irish, see Ireland.

SHIRLEY. There were three brothers called *Shirley*, or *Sherley* as the name was formerly spelled, all of whom were distinguished as travellers. They were sons of Thomas Shirley, an independent gentleman, who resided in Sussex.

Thomas Shirley, the eldest son, was born in 1564. After completing his studies at Oxford, he seems to have lived with his father till the reputation acquired by his brothers induced him to travel also. He appears to have been knighted, if Watt, in the 'Bibliotheca Britannica' is correct in calling him Sir Thomas. He published his 'Travels in

Turkey, 4to. black letter. We are not acquainted with the time and place of his death.

Anthony Shirley was born in 1565. After having taken his bachelor's degree at Oxford, where he studied with his brother Thomas, he served in the English army in Holland; and in 1596 sailed to the West Indies, in a squadron fitted out for the purpose of attacking the Spanish settlements there. On his return the following year he was knighted by Queen Elizabeth, by whom he was sent to Ferrara to aid the inhabitants in a dispute which they had with the pope; but this dispute having been settled before his arrival there, he resolved to travel into Persia, and left Venice for that purpose, March 24, 1598, accompanied by his youngest brother Robert. Sir Anthony, after his arrival at Casbin, soon acquired the favour of Shah Abbas, by whom, in April, 1599, he was sent as plenipotentiary, accompanied by Hosseyn-Ali-Bey, to the various courts of Europe, for the purpose of getting them to combine with the Shah in a war against the Turks. He went first to Astrakhan, thence to Moscow, thence through Germany to Venice, and thence to Spain. The king of Spain raised him to the dignity of admiral of the Levant Seas. He died in Spain in 1630 or 1631. An account of his voyage to the West Indies is given in Hakluyt's Collection, vol. iii., edition of 1600, 'A true Relation of the Voyage undertaken by Sir Anthony Shirley, knight, in 1596, intended for the island of San Thome, but performed to San Jago, Dominica, Margarita, along the coast of Terra Firma to the Isle of Jamaica, the Bay of Honduras, thirty leagues up Rio Dolce, and homewards by Newfoundland; with the memorable exploits achieved in all this voyage.' His travels in Persia were published in a separate form, 'Relation of Sir Anthony Shirley's Travels in Persia, with his magnificent Entertainment in Persia,' Lond., 1632, 4to., black letter. His travels by Astrakhan through Russia are given in Purchas's 'Pilgrimages.'

Robert Shirley was born about 1570. When Sir Anthony Shirley left Persia on his mission, Robert remained in the service of Shah Abbas, and had a situation in the army. In 1604 the Shah granted him permission to return to England, but charged him at the same time to visit the different Christian princes of Europe, and assure them of the Shah's good will towards them, and especially to offer to the English a free commerce with his kingdom. Shirley did not reach England till 1612. Having had an audience with James I. and remained a short time in England, he returned to Persia; but in 1616 Shah Abbas sent him, as he had previously sent Sir Anthony, as ambassador to the different European powers, for the purpose of inducing them to make war on Turkey. Having, after considerable delay, reached Madrid, the king of Spain, at his suggestion, sent out four galleons to close the entrance of the Red Sea against the Turks, on condition that the Bahrein island and some other places should be given to Spain. He then passed into Holland; but his long stay in Spain had made him an object of suspicion to the Dutch states, and he was requested to leave the country. He arrived in England in 1623. His letter of credit being written in Persian, no one could be found able to read it. At length, in 1626, Nogdi-Ali-Beg arrived in England as ambassador from Persia, and at his audience with James I. affirmed that Shirley was an impostor; and the letter having been shown to him, he attempted to tear it, and struck Shirley, and in excuse for his indecent violence said that he could not restrain his anger at seeing the signature of his sovereign counterfeited. To settle the difficulty, James I. sent out Sir Dodmore Cotton as his ambassador to Shah Abbas, accompanied by Nogdi-Ali-Beg and Shirley. The Persian died on the passage. Cotton having arrived at Casbin, and obtained an audience with the Shah's first minister Mahomet-Ali-Beg, the latter refused to admit Cotton to an audience with the Shah, and requested that Shirley's letter of credit might be left with him, and promised to return it on the following day, with the Shah's answer. After waiting three days, Mahomet-Ali-Beg 'came and told the ambassador that the king had looked upon it, had denied it to be his (the Shah's), and in a great rage had burnt it.' These are the words of Herbert the traveller, who accompanied Sir Dodmore Cotton as his secretary; and he further remarks, 'We all were verily persuaded he never showed it to the king, nor had any way inquired of him concerning it: the truth is, he had been bribed, but by whom it is unnecessary to speak; it may be we did but conjecture it.' Shirley was now old, and these indignities seem to have hastened his death, which took place at Casbin, July 13, 1628, about a fortnight after his arrival at that place. He appears to have been knighted, for Herbert calls him Sir Robert Sherley.

(*Biographie Universelle*; Herbert's *Some Yeares Travels into divers parts of Asia and Afrique*, Lond., fol., 1638.)

SHIRLEY, JAMES, was born in London, about the year 1594. He was educated first at the Merchant Tailors' school, London; next at St. John's college, Oxford, which however he left without taking a degree; and lastly he removed to the university of Cambridge. Having taken holy orders, he obtained a curacy near St. Alban's, but resigned it in consequence of having adopted the Roman Catholic faith. He then opened a school at St. Alban's, but not being successful, came to London, and commenced his career as an author. The first work which he published was 'The Echo, or the Unfortunate Lovers,' a poem, London, 1618, 8vo. His first dramatic work was 'The Traitor,' a tragedy, London, 1625. He continued to write for the stage till about 1640, when, having been especially patronised by the queen Henrietta Maria, on the breaking out of the civil troubles he joined the royalists, and served under the earl of Newcastle.

In 1642 the Long Parliament enacted that the exhibition of 'public stage plays shall cease and be forborne,' for certain religious and moral reasons which are stated in the preamble; other subsequent acts and decrees, during the republic and the Protectorate, continued to enforce the first enactment; and Shirley was again obliged to try the profession of a schoolmaster: he was more successful in London than he had been at St. Alban's. In 1646 he began again to publish plays and poems. After the Restoration, the prohibition of stage performances was removed, and Shirley continued as long as he wrote to be a favourite dramatist, as indeed he was the last of the great writers who belong to the Shakspere school. He does not appear to have published anything after 1659. He is the author of about 40 plays, in some of which he was assisted by George Chapman and others. The best edition of his 'Dramatic Works' is that by Gifford, London, 6 vols. 8vo. Besides plays and poems, he wrote 'Via ad Latinam Linguam' and 'Rudiments of Grammar.'

Shirley was burnt out of his house in Fleet-street by the great fire of London, and being obliged to retire to the suburbs, died there October 29, 1666. His wife died on the same day, and both were buried in the same grave.

Shirley belongs to the poetic class of the old English school of dramatists. He has not much inventive power; his plays are consequently somewhat meagre of incident; but this defect is in some degree compensated by frequent change of scene, and there is generally much animation in the dialogue. His characters are broad and general, not discriminated by nice shades, but well defined, distinct, and consistent. He displays the passions well; with less intensity indeed than Ford, but in a similar manner, poetically rather than naturally, without any of those sudden bursts and familiar touches by which Shakspere displayed them. His language is pure idiomatic English. His versification resembles Massinger's. It has the same 'linked sweetness long drawn out,' with more melody, and more enriched with poetic ornament. His plays are no longer acted; indeed they belong to a class not well constructed for keeping possession of the stage, but they are well worth reading.

SHIRVAN. [Georgia.]

SHIRWOOD or SHIREWOOD FOREST, or, as it is more commonly written, **SHERWOOD FOREST.** This woodland district, which once extended over a considerable part of the county of Nottingham, was antiently divided into two parts, called respectively 'High Forest' and 'Thorney Wood;' the latter of which, although the smaller of the two, included nineteen towns or villages (Nottingham among them) within its limits. Sherwood Forest is not mentioned by that name till the reign of Henry II., who used to hunt in it, and in whose time, or soon after, it is regarded in popular tradition to have been the retreat of Robin Hood. [Hood, Robin.] Leland speaks of it as 'the woddy forest of Sherwood, wher ys greate game of deere.' In Camden's time it was 'much thinner,' but still bred 'an infinite number of deer or stags with lofty antlers.' The forest now extends from Nottingham to near Worksop, 25 miles, and varies in breadth from 7 to 9 miles: it was the only forest remaining under the jurisdiction of the chief justice in Eyre of the Forests north of the Trent, an office abolished by statute 57 Geo. III., c. 61, and is the only forest belonging to the crown in that part of England. It is under a lord-warden, who holds his office, during pleasure, by letters-patent from the crown; and subordinate officers, the bow-bearer and ranger appointed by him, and four verderers elected by the freeholders. It is now in a great measure cleared, and a considerable portion enclosed. Few of the antient woods have been left, but considerable plantations have been made of late years. The revenue derived from the forest by the crown in the years 1803-1832, both inclusive, was 50,926*l.* 3*s.* 3*d.*; the expenditure was 3393*l.* 18*s.* There are some noblemen's or gentlemen's parks within the limits of the forest, as Welbeck, Clumber, Clipstone, &c. The extent of the forest, according to a survey in 1609, was as follows:—

		Acres.
Antient enclosures equal to		44,839
„ woods		9,486
„ wastes		35,080
Parks.—Clipstone	1583	
Beskwood	3672	
Bulwell	326	
Nottingham	129	
		5,710
		95,115

Up to the close of the last century, the following enclosures had been made:—

	Acres.
In 1789 in Arnold Forest	2280
1792 „ Basford	1158
1794 „ Sutton in Ashfield	2608
1795 „ Kirkby in Ashfield	1941
1796 „ Lenton and Radford	261
	8248

Since then there has been an addition to the enclosures of 3087 acres in the township of Edwinstowe, by act 58 Geo. III., c. 100.

SHOEMAKER, properly the maker of the shoe, though this name is often applied to every one connected with the calling, as he who makes the boot or any other article in the trade, and also to the employing party as well as the employed. In the old statutes he is called a cordwainer, apparently a corruption of the French *cordonnier*, which means a worker of Cordova leather. [CORDOVA.] The companies of shoemakers in our antient towns were incorporated under this name; and where some of these companies still exist, they go by the same name. As a legal term cordwainer is still common.

In Rossellini's work on the 'Antiquities of Egypt,' we find various illustrations of the manufacture of the sandal; a proof of the high antiquity of the art as a peculiar occupation.

The streets of Rome, in the reign of Domitian, were at one time so filled with cobblers' stalls, that the emperor had to issue an order to clear them away. St. Anianus, a contemporary with St. Mark, Butler tells us, was a shoemaker; and Crispin and Crispinian, brothers and martyrs, have the well-known repute of belonging to the trade. They are its patrons: they have their fête-days in all Roman Catholic countries; and though there is no longer any religious observance of the day in this kingdom, the name of Crispin is still placed in the calendar against the 25th of October; and the shoemaker has still his traditions and his usages connected with the saint-day.

The law of England formerly not only took cognizance of the quality of the leather which the shoemaker wrought into his goods, but of the number of stitches that he furnished. An individual now in London has told the writer, that the man to whom he had been an apprentice in one of the small towns in the north of England, had authority in this way: so that whenever, on his inspection in the shoe-market, the standard of perfection was wanting—and the breadth of his thumb was the usual gauge as a measure for an inch,—he had power to make seizure of the articles.

The trade, as now followed in London and other principal places, is subdivided into about twenty branches. (*Guide to Trade*, 'Shoemaker,' p. 15.) The following however may be set down as the chief: the shoeman, or maker of the sole part of the shoe; the bootman, or maker of the sole part of the boot; and the boot closer, or joiner together of the leg, vamp, &c. The labour of these is especially directed to what is called the *men's line;* whilst others make the ladies' shoe or boot. There are many women too who get a livelihood by closing the shoe; while others again follow the various sorts of binding.

The shoe, being previously cut out and closed, goes through sundry operations: the lasting or tacking of the upper-leather to the in-sole, the sewing in of the welt, the stitching to this welt of the out or top sole, the building and sewing down of the heel; and, lastly, the setting or taking off, as it is technically called: these are the principal operations, but, besides these, various less important ones are necessary. The duty of the shoeman being completed, he then, if an employed workman, returns the article to his employer, when it is rounded, that is, pared round the quarters and across the top of the vamp. The shoe is then sent to be bound; and, finally, being polished or cleaned up, becomes ready for the purchaser.

In the manufacture of the boot, the clicker or cutter having designed and cut the leather of the vamps, legs, &c. to the measure of the customer or the size wanted, the materials go to the closer. As a separate workman the boot-closer has not been known above fifty or sixty years; and as yet only in these countries. The making and closing in all other places go together. Much of the boot-closer's art, as now perfected, is of a very delicate nature, especially in the putting together or closing of all the parts of the top-boot, and the fancy-wrought and coloured Wellington of late years in fashion; the common Wellington being the easier portion of his occupation. In closing the top-boot, it usually goes twice through the hands of the workman; the first time to do what is called the tongue part, the closing of the vamp and counter to the leg; and again, after having the bottom or sole attached, to finish it, that is, to close it up behind, make and put on the top, &c. Much nice jobbing, in alterations and repairing of fractures, belongs also to the department of the boot-closer.

The office of the bootman has already been mentioned. He does for the boot what the shoeman does for the shoe; he makes or attaches the sole. The labour of this person however is much better paid than that of the shoeman; besides, it has a higher character, and considerably more time is required to complete the article. The lasting is more difficult; what is termed a rand is made to the heel of the boot, or, as latterly has been much the custom, the French seat; and this, with what is called the shank-piece, a strengthener between the inner and outer sole, which runs along the waist of the boot, are additions to the work bestowed upon the shoe, and therefore require and receive an extra pay. The best shoemen usually at the first opportunity take to be bootmen, though this is not always the case—the lighter exertion required in the shoe being to some a counterbalancing inducement.

The employing master, or the clicker who acts for him, takes measure of the customer, chooses his materials, gets his Wellington fronts to be blocked, fits up the lasts, cuts out the work for the closer, prepares and sorts the sole or bottom-stuff for the maker, sees that the workmanship is to his satisfaction, and polishes or has the boots cleaned up for sale.

Of the making of the woman's common or welted shoe, we have given no description: it resembles that of the man's; and where it differs it is unnecessary here to explain. The man's and woman's single-sole shoes or 'pumps' are also proceeded with in the same manner; but in those 'cheap' women's shoes now so abundantly manufactured there is much deception; so that *cheap* is only another word for what at last proves to be perhaps the *dearest* part of the female's expenditure for wearing-apparel. London is at present the chief place where these articles are manufactured. At Northampton a very large number of men's sale boots and shoes are produced. The business done in this branch of the trade is immense: a pair of woman's shoes or boots can be purchased at a very low rate, and men's boots and shoes at a proportionately low rate. The wealthier and more tasteful consumers still continue however to prefer bespeaking their boots and shoes, and thus a large proportion of the body of shoemakers find encouragement in the perfecting of their art.

Formerly it was the general practice for the journeyman to work in the shop with his employer; two, three, six, or more all working together. The journeymen then had sometimes, as now, so much per pair; but he was also paid by the day or week, or was even engaged as a quarterly or half-yearly servant. In every case he had his coals and candles in winter, and in all seasons his finding or grindery free, that is, his hemp, wax, paste, bristles, &c. Wages then were very low; but the work being of an inferior description, and the habits of the time very plain and simple, it is to be presumed, from every notice we have of the calling, that the shoemaker had seldom cause to complain. In London, about the year 1780, under the liberal encouragement principally bestowed by the well-known Hoby, a remarkable improvement was effected in the art; and stimulated as this was by the active rivalry of the eccentric O'Shaughnessy, a bootmaker too, like the other, for the royal and the noble, the improvement went regularly on; and the result was, that the position of the workman became almost entirely altered. The higher pay that he received gave him higher inducement, a more independent feeling, a greater desire to throw off the partially domestic character which he hitherto had borne. He gave up working in the shop of his master, or in garrets with sixes and sevens; and if married, he followed his employment in his own home; or when single, he joined himself in a sort of partnership with another workman in a like condition, and taking a furnished lodging, felt more at ease than under the former system of constraint. This still is the practice among the better-paid classes of the trade.

Dr. Thackrah, in reference to the health of the shoemaker, has these remarks:—'Shoemakers work in a bad posture, by which digestion and circulation are so much impaired that the countenance marks a shoemaker almost as well as a tailor. From the reduction of perspiration and other excretions, in this and similar employments, the blood becomes impure, and the complexion darkened. The secretion of bile is generally unhealthy, and bowel complaints are frequent. In the few shoemakers who live to old age, there is often a remarkable hollow at the base of the breast bone, occasioned by the pressure of the last.' In another place he expresses an opinion that the masters possess the power of remedying these evils. For the 'bad posture' which he speaks of, a remedy has more than once been attempted. In some of our Encyclopædias, notice is taken of a sort of standing bench which has been constructed for the shoemaker to work at, instead of his present low seat; and in the model-room of the Society of Arts, Adelphi, Strand, there are some five or six representations of these benches. As this collection is now thrown open to the public, it is to be hoped that some of the more considerate of the trade will take the pains to examine into the matter, and if they find the invention to offer any greater security for health, that they will do what they can to introduce it into general use.

In adverting to the condition of the shoe-trade, as connected with the possibility of improvement, one very gratifying feature of the present time is the getting up of what are generally called 'Pension Societies' for the relief of old, infirm, or decayed members among the particular fraternity. The journeymen printers of London have their association for this purpose, and so have the bookbinders, the tailors, and various other occupations. Among the master boot and shoe makers a similar society has been formed, and has gone on very favourably; and there is no reason why the humbler workman should not attempt something of the same kind. At present there is much loss of time, and also much money wasted by the journeyman shoemaker in far less useful objects. Much money goes for the drink demands of their meetings; much in payment of their officers; and much is being continually expended in a fruitless system of warfare from shop to shop, and from season to season, not to mention the many dishonest abstractions of their funds, of which the mere Union jobbers are so often guilty. Any more secure investment of their savings would soon effect a considerable improvement in their condition.

SHOE TRADE. None of the common handicrafts is exercised by so large a number of persons as that of the shoemaker. Tailors, who are however engaged in making clothing for scarcely one-half of the population, are rather more than one-half as numerous as shoemakers. The number of males twenty years of age and upwards returned under the census of 1831 as 'shoe and boot makers and menders' was 110,122 in England, 5819 in Wales, and 17,307 in Scotland; total 133,248. Thus in England there was one shoemaker to every 118 persons; in Wales, one to 138; and in Scotland, one to 136. There is a remarkable uniformity in all the English counties, Northamptonshire excepted, where the proportion is one to about 80; but in Scotland this is not the case: in Inverness-shire the proportion is one to 216; and in Sutherlandshire one to 250. Any calculation as to the value of this trade must be received merely as an approximative estimate; but that it is an important branch of domestic industry is sufficiently obvious. Excluding children under five years of age, we have at present in Great Britain a population of about 16,000,000, whose annual expenditure on boots and shoes, averaged at 15*s.* each, will amount to 12,000,000*l.* per annum, distributed in payment of the raw material, in rent, in profits to the masters, wages of journeymen, and cost of maintaining apprentices. The number of boot and shoe makers and menders employed in the parishes within eight miles of St. Paul's was 16,502 in 1831; at Northampton 1300 were employed; at Stafford 800; and in each of the two last-mentioned counties there were considerable numbers engaged in producing an article consumed elsewhere. In the metropolis and in the above counties women are extensively employed in the lighter parts of the business. The government contracts for the army and navy, the police, &c. are executed in London and at Northampton and Stafford; and the export market is almost entirely supplied from these quarters.

There are no documents showing the exact quantity of boots and shoes exported, as they are included under the general designation of leather 'wrought and unwrought,' exclusive however of 'saddlery.' The return under this head in the following years was as under:—

	lbs.	Declared Value.
1829 . .	1,338,937	£268,380
1837 . .	1,647,000	255,818
1839 . .	2,584,484	382,995

It is computed that about two-thirds of the above quantities consist of boots and shoes, which are exported chiefly to the East and West Indies, British North America, and the other colonies.

There is a protecting duty of 30 per cent. ad valorem on the importation of boots and shoes: notwithstanding which importation does takes place, chiefly from France. The quality of French boots is said to be excellent, they wear easily, and are of neat workmanship. A proposition has been made to reduce the duty to 20 per cent. ad valorem. The gross revenue on boots and shoes imported in 1839 was 4121*l.* In 1829 the net duty was 2202*l.*, previously to which year the duty was included under the head of 'leather' or 'silk' manufactures. The following return, showing the importations of the year 1839, is taken from the Appendix to 'Report on Import Duties,' and is the only one which has been made public. The duty is charged per dozen pairs.—

	Women's.		Girls'.	
	Pairs.	Duty.	Pairs.	Duty.
Boots and calashes .	1,364	30*s.*	1	20*s.*
Ditto, lined or trimmed	153	36*s.*	—	24*s.*
Shoes, with cork or double soles, &c. and clogs . . .	2,464	26*s.*	3	17*s.* 4*d.*
Ditto, lined or trimmed	179	29*s.*	—	19*s.* 4*d.*
Shoes of silk or other stuffs, or kid, morocco, or other leather	33,667	18*s.*	320	12*s.*
Ditto, lined or trimmed	232	24*s.*	2	16*s.*
	Men's.		Boys'.	
Boots . . .	4,977	54*s.*	4	36*s.*
Shoes . . .	777	24*s.*	3	16*s.*

In a Parliamentary Paper (398, Sess. 1840), the quantity and value of boots and shoes imported from France are given; and this also is the only return of the kind which has been published:—

	Pairs.	Official Value.
1829 . .	42,399	£8,506
1830 . .	43,543	8,999
1831 . .	44,665	9,199
1832 . .	45,591	9,459
1833 . .	53,736	11,177
1834 . .	54,200	11,379
1835 . .	46,653	9,802
1836 . .	45,989	10,200
1837 . .	56,204	12,301
1838 . .	50,850	11,997
1839 . .	48,824	12,191

SHOKHNAH, IBN, is the surname of a celebrated Mohammedan writer named *Muhibbu-d-din Abú-l-walíd Mohammed Ibn Kemáli-d-din Ibn Shokhnah,* who was Kádhi-l-Kodhát, or supreme judge of the Hanefite sect in the province of Irák or Mesopotamia. Having from his early youth given proofs of great talent, and composed several works on theology and jurisprudence, he was appointed cádi of one of the mosques of Damascus, and in course of time was raised to the highest ecclesiastical office among the Mohammedans, namely that of Sheikhu-l-Islám, or Mufti, or, as it is otherwise called, Kádhi-l-Kodhát, supreme Kádhi or judge of Irák. Ibn Shokhnah died at Damascus, in A.H. 883 (A.D. 1478). He left, among other historical works, 'Randhatu-l-manátzir fi akhbári-l-awáyil wa-l-awákhir' (the garden of the overlooking places, or the history of antient and modern times). It is a sort of abridgment of Abú-l-fedá's large historical work, and contains a chronological history of the world from the creation to the year 1403 of our æra. It is divided into four books or sections, and contains much useful information, comprising many events which escaped that celebrated historian. Ibn Shokhnah also wrote a work on jurisprudence and canonical law, entitled 'Lisánu-l-hokham fi maarefati-l-akhám' (verbal decisions of the judges, or a knowledge of law), which is in the Royal Library of Paris.

SHOOTER'S HILL. [KENT.]

SHO'REA, a small Indian genus of the natural family of Dipterocarpeæ, named in compliment to Sir J. Shore, afterwards Lord Teignmouth, then governor-general of Bengal. The genus is found as far south as the line; and S. robusta, the best known and most useful species, as far north as 30° North latitude, in many parts forming the forests which skirt the south-western base of the Himalayan Mountains.

The genus is characterised by having a calyx of five sepals enlarging into 5 long wings. Petals 5. Stamens 25 to 30. Fruit one-celled, three-valved, and one-seeded.

The family to which the Shorea belongs is remarkable for the number of useful products yielded by its different species, as the camphor of Sumatra, resin, wood oil, and valuable timber. Shorea robusta is remarkable on all these accounts, as it is a lofty and ornamental tree with showy inflorescence: it is well known as a timber-tree by the name of *Saul* or *Sāl*, and chiefly employed in the north-western provinces of India in all government works, house timbers, gun-carriages, &c. The wood is of a uniform light-brown colour, close-grained and strong. The tree exudes a resin which by the natives is called *ral*, and by the Europeans one of the kinds of Dammer, being used for the same purposes as many other resins, and in Bengal very frequently as a substitute for pitch in the dock-yards. It is also sometimes used by the Hindus as an incense.

SHOREHAM, a parliamentary borough and a seaport-town, is situated in a valley of the South Downs at the mouth of the river Adur, near the centre of the county of Sussex, and 57 miles south from London. The borough of Shoreham, now called New Shoreham, was part of the possessions conferred by the Conqueror upon William de Braose, lord of the rape of Bramber. The intercourse between England and Normandy at that time was considerable, and the Adur became a port of some consequence. John landed here from Normandy with a large army in 1199, and he made it a free port in 1210. In the time of Edward III. (1346) it contributed 26 ships towards the two fleets of 706 which were fitted out by the king, being one ship more than was furnished by London; Fowey, Yarmouth, and Dartmouth alone furnished a larger number. But the encroachments of the sea and the attacks of foreign enemies so reduced the town, that in the time of Camden 'the commodiousnesse of the haven, by reason of bankes and barres of sand cast up at the river's mouth, was quite gone.' In 1758 the first act was obtained for its security and improvement, but the embouchure continued to shift towards the east, and advanced a mile and a half in the course of half a century, so as to render the haven of little use. The proximity however of the rising towns of Brighton and Worthing turned public attention towards the improvement of this port, and in 1816 the cutting of an artificial channel through the shingle embankment and the erection of substantial piers, which have rendered the mouth of the harbour permanent, were effected by Mr. William Clegram. The opening is preserved by wooden piers (formed of piles) 218 feet apart, which run in a south-south-west direction across the shingle into the sea. Within this entrance a third pier has been built out from the shore nearly across the harbour, for the purpose of driving the water, on the ebb, from the eastern and western sides of the inlet, directly to the mouth. The great body of water which thus ebbs and flows through the entrance keeps the channel open; and though the width is so considerable, the stream runs between the pier-heads at the rate of five or six miles an hour. The harbour-mouth is nevertheless subject to a bar, which rises occasionally above the low-water level, and shifts its position from 60 to 160 feet from the pier-heads. The lift of the spring-tides is about 15 feet, and neaps about 9 feet. The depth of the water over the bar at high-water is from 14 to 17 feet, according to the tides and the state of the bar. The Adur was formerly crossed by a ford once belonging to the priory of Hardham. In 1782 a long narrow bridge was built over the old ford a mile above the town; the money was raised in shares by way of annuity, and the income arising from the tolls, after the death of the annuitants, fell to the duke of Norfolk. In the year 1833 the present duke built at his own expense, and under the direction of Mr. Clark, a beautiful suspension bridge nearer the mouth of the river and close to the town.

The chief trade of Shoreham consists in the export of timber, and the import of coals, corn, timber, and Irish provisions; and it is a warehousing port for all descriptions of timber, and for West Indian, Mediterranean, African, Russian, French, Dutch, and other produce. The number of vessels that annually enter the port exceeds 1000, the united tonnage of which is 90,000, giving employment to 5000 mariners. Shoreham has long been noted for its ship-building, which continues to flourish.

The borough of New Shoreham returned two members to parliament from the 23rd Edw. III. till the 11th Geo. III., c. 55, in which it was declared that a wicked and corrupt society, calling itself 'The Christian Club,' had for several years subsisted in the borough, and consisted of a great majority of persons having the right to vote; that the chief end of that society appeared to be for the purpose of selling from time to time the seats of that borough, and that John Burnett and eighty others were members of such society. It was therefore enacted that these eighty-one persons should be thenceforth disqualified from ever giving a vote at any election for members to serve in parliament; and that the right of voting should thenceforth be exercised by every 40s. freeholder within the rape of Bramber, as well as by the burgesses of New Shoreham.

The town is irregularly built, and the houses are for the most part old. A corn-market is held on Mondays. Shoreham is within the diocese of Chichester. The church, dedicated to St. Nicholas, is a large and elaborately finished edifice: the mixture of the round and Gothic arches fixes its date about the middle or latter end of the twelfth century. It was originally a stately and capacious edifice of a cruciform shape, with a handsome tower in the centre of the cross, but the nave has long been destroyed. The living is a vicarage, the present endowment of which consists of [illegible] from tithe and glebe, and the interest of 200*l.* private benefaction, 800*l.* royal bounty, and 800*l.* parliamentary grant. The population of the parish, in 1831, amounted to 1503.

(Dallaway's *Western Sussex;* Horsfield's *History of Sussex,* 4to., 1835; Cooper's *Parliamentary History,* 4to., 1835; *Burrell MSS.; Parliamentary Papers,* &c.)

SHORTHAND. [STENOGRAPHY.]

SHORTSIGHTEDNESS. [SPECTACLES; VISION.]

SHOT are the balls (generally solid) of iron which are discharged from guns, howitzers, or carronades. Those which are used for the first of these kinds of artillery vary in diameter from 1·955 inches, which is that of a one-pound ball, to 7·95 inches, which is the diameter of a 68-pound ball. Shot for howitzers vary in diameter with the nature of that arm, from 4·476 inches, which is the diameter of a 12-pounder howitzer, to 9·88 inches. Carronades discharge balls weighing from 6 lbs. to 68 lbs., which are of course equal in diameter to those which belong to guns of equal calibre. For the naval service it has recently been proposed to discharge from howitzers hollow shot or unloaded shells, which, having greater diameters than solid shot with equal weights, are capable of producing more destructive effects against shipping.

SHOT AND SHOT-MAKING. [LEAD.]

SHOVEL, SIR CLOUDESLEY, an English admiral, born (1650) of poor parents. He was first noticed by Sir John Narborough, with whom he went to sea as a cabin-boy, but from his great merit soon rose to the rank of an officer. In 1674, while on an expedition to Tripoli, he was sent by his patron with a message to the Dey, on which occasion he behaved with great discretion; and through some observations made by him while on shore, Sir John Narborough was enabled to enter the harbour and burn the ships of the enemy. The next year, in consequence of this service, he was appointed to the command of a ship. He continued in employ during the reign of James, who appointed him to the command of the Dover. On the accession of William he took the side of the new king, and distinguished himself so much in the battle of Bantry Bay as to obtain the honour of knighthood. In 1692 he was appointed rear-admiral of the red, and soon after was present at the battle of La Hogue, to which victory he greatly contributed. In 1694 he served under Lord Berkeley in the expedition to Camaret as vice admiral of the red; and on the return of the latter to England, took the chief command in the expedition against Dunkirk. In the reign of Queen Anne we find him employed till 1702, when he was sent to Vigo to bring back the prizes left by Sir George Rooke. In 1704 he reinforced the fleet of this officer in the Mediterranean with a powerful squadron, and led the van in the battle of Malaga. In 1705 he held the command of the fleet sent to Spain jointly with the Earl of Peterborough, and had an active share in the capture of Barcelona. He returned to England the same year, and in 1706 sailed to Portugal with Lord Rivers to the relief of the young king of that country. He continued in command there till 1707, when he joined the Duke of Savoy in the siege of Toulon; after the raising of which he proceeded homewards with nine ships of the line, and was unfortunately wrecked off the Scilly Isles, Oct. 22, 1707. The circumstances of his death were peculiar. He is said to have been thrown on shore alive, and to have been murdered by one of the islanders for the sake of a valuable ring. Shovel is called by Bishop Burnet ('History of his own Times') 'one of the greatest seamen of the age;' and his whole career was as honourable to himself as it was creditable to the judgment of Sir John Narborough, who first drew him forth from an obscure condition. (Campbell's *Lives of English Admirals*; Cunningham's *Eminent Englishmen*.)

SHOWERS OF STONES. [AEROLITES.]

SHREWSBURY, the county town of Shropshire, in the liberty of Shrewsbury, 138 miles from St. Paul's, or the General Post-Office, London, in a direct line north-west, or 158 miles by railroad to Birmingham, and from thence by the Holyhead parliamentary road through Wednesbury, Wolverhampton, and Shiffnal: in 52° 42′ N. lat. and 2° 45′ W. long.

It is probable that the town was founded by the Britons of the kingdom of Powis, while they were yet struggling with the Saxons, or rather the Angles, for the midland counties; and it is supposed to have been established by them as a stronghold when they found Wroxeter (the Uriconium of the Romans) no longer tenable. The Welsh name was Pengwern. On the conquest of the town by the Anglo-Saxons, it received the name of Scrobbes-byrig, importing that it was a town in a scrubby or bushy spot; and of this name the modern Shrewsbury is a corruption. Ethelfleda, 'the lady of the Mercians,' daughter of Alfred the Great, founded the collegiate church of St. Alkmund, and Athelstan established a mint here, and it soon became, if it was not then, the chief town of the shire, for in the 'Saxon Chronicle,' in the account of the reign of Ethelred II., Scrobbes-byrig-scire (now corrupted into Shropshire) is mentioned.

According to Domesday-book the town had, in Edward the Confessor's time, two hundred and fifty-two houses, with a resident burgess in each house; also it had five churches. It was included in the earldom of Shrewsbury, granted by William the Conqueror to his kinsman Roger de Montgomery, who erected a castle, to clear or enlarge the site for which fifty-one houses were demolished; fifty others lay waste at the time of the Domesday Survey, and forty-three were held by Normans. The castle was erected at the entrance of the peninsula on which the town stands. There had been a castle here previously, which was besieged A.D. 1068, by the Anglo-Saxon insurgents and the Welsh, who burnt the town. The castle and town were surrendered to Henry I., by Robert de Belesme, the third earl, who had risen in arms in favour of Robert, duke of Normandie, Henry's brother. After being held for several years by the crown, the earldom was granted by Henry (A.D. 1126) to his second wife. Her castellan and sheriff Fitz-Alan, held the castle for the empress Maud against Stephen, who took it by assault (A.D. 1138), and treated the defenders with great severity. It was retaken by Henry, son of Maud, afterwards Henry II., towards the close of Stephen's reign (A.D. 1152), and the custody of the castle was restored to Fitz-Alan. The town received a charter from Henry II., but the earliest charter extant is of Richard I. In A.D. 1215 the town was taken by the Welsh under Llewelyn the Great, prince of North Wales, who had joined the insurgent barons against John, but was not long held by him. In the subsequent reign Shrewsbury was repeatedly the scene of negotiation between the English and Welsh, or the place of rendezvous in the time of war for the English forces: at other times the surrounding country was exposed to the ravage of the Welsh, and in A.D. 1234 a part of the town, or more probably a suburb, was burnt by Llewelyn of Wales and Richard earl marischal, an insurgent English baron in alliance with him.

In the war of Henry III. with his barons, Shrewsbury was taken (A.D. 1264) by Simon de Montfort, the leader of the insurgent barons, and Llewelyn, grandson of Llewelyn the Great, prince of Wales; but the battle of Evesham (A.D. 1265) restored it to the crown. In A.D. 1283 a parliament was assembled at Shrewsbury for the trial of David, the last prince of Wales, who was executed as a traitor.

In the revolution which dethroned Edward II., the earl of Arundel, who attempted to support the king's cause, attacked Shrewsbury, but was defeated and taken by the burgesses, with the aid of Sir John Charlton of Powys, and beheaded at Hereford (A.D. 1325). In the reign of Richard II. a parliament was held here (A.D. 1397-98), at which the earl of Hereford (afterwards Henry IV.) brought the charge of treason against the duke of Norfolk. In the early part of the reign of Henry IV. (A.D. 1402) that king assembled an army here to march against Owen Glendower; and the year after he fought the famous battle of Shrewsbury against the insurgent Percies and their allies.

The insurgents, under the younger Percy (Hotspur), were marching from Stafford towards Shrewsbury, which they hoped to occupy, as its command of the passage over the Severn would enable them to communicate with their ally Glendower; but the king, who came from Lichfield, reached Shrewsbury a few hours before them (July 19) Henry set fire to the suburb adjacent to the castle, and marched out to offer battle; but Hotspur, whose forces were weary with their march, drew off, and the battle was fought next day at Hateley Field, about three miles north by east of the town. Hotspur had about 14,000 men, a considerable part of them Cheshire men, who were famous for their skill as archers. Henry's force was nearly twice as great. The engagement was very fierce, but the death of Hotspur decided the battle. The insurgents were defeated with great slaughter: the earls of Douglas and Worcester and Sir Richard Venables were taken; the first was released, but the last two, with some others, were beheaded without trial.

In the war of the Roses, Shrewsbury supported the Yorkists, and Edward IV. showed much favour to the townsmen His second son Richard, the younger of the two princes murdered in the Tower, was born here. The earl of Richmond, on his march previous to the battle of Bosworth, was received into Shrewsbury with some reluctance by the magistrates, but with acclamations by the townsmen.

In the civil war of Charles I. the king came to Shrewsbury, where he received liberal contributions of money and plate from the neighbouring gentry, and largely recruited his forces. The earl of Denbigh and Colonel Myttori, the parliamentary commanders, having approached Shrewsbury (July, 1643), were repulsed by Sir Fulk Hunkes, an officer of the royalist garrison, of which Sir Francis Ottley was governor. The town was however surprised and taken by the parliamentarians (February, 1644). A plot formed by the royalists to surprise Shrewsbury (A.D. 1655) failed. Another attempt (A.D. 1659) after Oliver Cromwell's death met with no better success. The only subsequent events worthy of notice are the visit of James II. (A.D. 1685); the triumphant entry of Sacheverel, in his memorable progress (A.D. 1710), and the riotous destruction of the Presbyterian meeting-house (A.D. 1714).

The town stands chiefly on a peninsula formed by the Severn. It was formerly wholly contained within this peninsula, but has gradually extended beyond the Severn on the east and west side, forming the suburbs of Abbey-Foregate and Coleham on the east, and of Frankwell on the west; and on the north extending beyond the isthmus or neck occupied by the castle, forming the suburb of the Castle-Foregate. The streets are irregularly laid out, and for the most part inconveniently narrow, though several improvements have been made under an act of parliament obtained in 1821: the streets are indifferently paved, and lighted with gas; water is provided by a water-company, at an average charge of twenty shillings per annum for each house: the water is brought from a spring two miles distant. The only part of the antient walls which remains is a ruinous wall erected by Cromwell on the north-west side of the town, between the isthmus and the Welsh bridge; and a tower, and (unless lately demolished) part of the wall on the south side. There are some remains of the castle, especially of the keep, which has been modernised, of the walls of the inner court, the great arch of the inner gate, a lofty mound on the bank of the river, and a fort called Roushill, built by Cromwell. The houses in the town are of very varied character; modern buildings, many of them handsome, being mingled with others of greater antiquity. There are two bridges over the Severn: the English bridge (built A.D. 1774), a handsome freestone structure of seven semicircular arches, connects the Abbey-Foregate with the town; and the Welsh bridge, a neat plain structure of five arches, connects Frankwell with it. There is another bridge at Coleham over the Meol brook, which joins the Severn above the English bridge.

There are some remains of the Benedictine abbey founded by Roger de Montgomery (A.D. 1083), and which had at the dissolution a revenue of 615*l.* 4*s.* 3½*d.* gross, or 532*l.* 4*s.* 10*d.* clear. It occupied a low site of about ten acres, in the suburb of Abbey-Foregate. Part of the embattled wall which enclosed the precinct remains: it is nearly entire on the north and east sides. The enclosure is occupied by a modern mansion with its garden and fishpond; and in the garden is a beautiful stone pulpit of decorated character, covered with a profusion of ivy. The abbey church, a cruciform structure, was in great part demolished at the dissolution; but the nave, western tower, and north porch remain, though in a very dilapidated condition, and constitute the parish church of Holy Cross parish. The architecture was originally Norman; but it has undergone material alterations, especially by the insertion of a large perpendicular window in the face of the western tower. Beneath this window is a Norman doorway, the deep recess of which is adorned with various mouldings. St. Alkmond's church has been rebuilt in modern times, with the exception of the tower and spire (184 feet high), which belonged to the more antient structure. St. Chad's has also been rebuilt: it is a Grecian structure, of circular form, with a tower 150 feet high. A small part of the old church of St Chad (part of the south aisle of the chancel) now remains, and is used as a school: it is a curious structure, and contains Norman, early English, and decorated remains. St. Julian's was rebuilt about the middle of the last century; but the tower, which is of Norman architecture, belonged to the old church. St. Mary's is an antient large and fine cross church: the lower part of the tower and the south porch are of good Norman architecture, the rest of the church is principally early English, with some windows (especially those of the clerestory, which are all perpendicular) of later date: there is a very good perpendicular font. There is an antient chapel of St. Giles in the Abbey-Foregate, originally attached to the hospital of the abbey; it has been repaired within these few years. There are two modern chapels-of-ease, one to St. Mary's in the Castle-Foregate and one to St. Chad's in Frankwell; and there are several dissenting places of worship.

Among other buildings may be mentioned the town and shire hall, a spacious and handsome stone building containing two courts for the assizes, a room for county and corporation meetings, a grand-jury room with some interesting portraits, and other offices; the town and county gaol and house of correction; the military depôt, a handsome brick building near the Abbey-Foregate; the house of industry in Meol-Brace parish; the infirmary; the column in honour of Lord Hill, at the entrance of the town from London; the public subscription library, the theatre, and the assembly-rooms. On the south-west side of the town is 'the quarry,' a handsome public walk planted with lime-trees, comprising about 20 acres, and extending along the bank of the Severn.

The borough of Shrewsbury, before the alterations made by the Boundary and Municipal Reform Acts, comprised the six parishes of St. Alkmond, St. Chad, Holy Cross with St. Giles, St. Julian, St. Mary (the greater part of it), and Meol-Brace; and had an area of 14,680 acres. There were, in 1831, 4037 houses, inhabited by 4509 families, 177 houses uninhabited, and 46 houses building; with a population of 21,297. The liberties of the borough had, in addition, 435 houses, inhabited by 448 families, 7 houses uninhabited, and 2 houses building. The trade of the town is considerable, especially in Welsh cloths and flannel from the counties of Denbigh, Montgomery, and Merioneth; thread, linen-yarn, and canvas are manufactured, and there are iron-works at Coleham. The town has long been famous for brawn and 'Shrewsbury cakes.' There are markets held on Wednesday and Saturday, the latter for grain; there are market-houses for the corn and general markets. The Severn is navigable for boats of 30 or 40 tons, and there is a canal to Wombridge which opens a communication with the Staffordshire collieries.

The quarter-sessions and assizes for the county are held here; and it is the place of election and a polling-station for the northern division of the county.

Shrewsbury is a borough by prescription: the jurisdiction of the corporation extends over the borough and liberties. The boundaries of the borough, as enlarged by the Boundary Act, were adopted in the Municipal Reform Act, by which Shrewsbury was divided into five wards, and had allotted to it 10 aldermen and 30 councillors. Quarter-sessions and petty-sessions, the latter at least once a week, are held; and there are a court of record and a court-leet. The borough has sent two members to parliament from 23 Edward I.

The livings of St. Alkmond, St. Chad, and Holy Cross with St. Giles, are vicarages, of the clear yearly value of 219*l.* (with a glebe-house), 350*l.*, and 323*l.* respectively; St. Julian and St. Mary are perpetual curacies, of the clear yearly value of 159*l.* and 312*l.* respectively. All are in the archdeaconry of Salop and the diocese of Lichfield and Coventry, except St. Mary's, which is a royal peculiar or free chapel.

There were in the borough, in 1833, four dame or infant schools, with 165 boys and 149 girls: twenty-seven other day-schools of all kinds, with 939 boys and 750 girls; two of these schools, with 67 boys and 237 girls, were also Sunday-schools; and there were besides eight Sunday-schools with 444 boys, 275 girls, and 310 children of sex not specified. There was also one evening school with 35 children of sex not specified. One of the day-schools was the 'Royal Free Grammar-School,' which was endowed by King Edward VI., and was long under the care of the late Dr. Butler, afterwards Bishop of Litchfield and Coventry: it had, in 1833, 260 boys: two others were 'national' schools; another a Lancasterian school; and another, 'the Blue' or 'Bowdler's Charity-School,' was well endowed.

Among the natives of Shrewsbury were Speaker Onslow, Job Orton and Hugh Farmer, dissenting divines of note, Dr. Charles Burney, the author of the 'History of Music,' and Costard the mathematician.

(Owen and Blakeway's *History of Shrewsbury;* Rickman's *Gothic Architecture; Parliamentary Papers.*)

SHRIKES, the English ornithological name of the *Butcher Birds* (*Lanius*, Linn.).

Linnæus places his genus *Lanius* at the end of his first order, *Accipitres*, immediately following the owls (*Strix*). The *Picæ* form the succeeding order.

Cuvier makes the *Pies-Grièches* (*Lanius*, Linn.) the first great genus of his *Dentirostres*, his second order; the *Oiseaux de Proie* (*Accipitres*, Linn.) being his first.

Vigors observes that in the characters of the notched, depressed, and angular bill, and the strong hairs or vibrissæ that surround its base, as well as in their manners, the *Muscicapidæ* partially correspond with the *Laniadæ*, from the earlier families of which they chiefly differ in their inferior power and robustness. Entering among the *Laniadæ* by the genus *Tyrannus*, Cuv., which unites them with the preceding *Muscicapidæ*, and from which he would separate it chiefly on account of the strength of the bill, wherein the character of a *Shrike* is more conspicuous than that of a *Flycatcher*, Vigors proceeds by means of *Psaris*, Cuv., and

Artamus, Vieill., to *Dicrurus*, Vieill., the fork-tailed Shrikes of the Old World, where the base of the bill is still depressed and wide, as in the groups just quoted, but the apex gradually more compressed. Hence, he remarks, we are led by some intervening forms to the still more compressed bills of *Sparactes*, Ill., and the true *Lanius* of authors, which, by its short, compressed, and strongly dentated bill, exhibits the type of the family. 'Here,' continues the author, 'we are met by some conterminous groups, among which *Falcunculus*, Vieill., is conspicuous. And hence we descend by intermediate gradations to the more lengthened and slender-billed *Vanga*, Cuv., together with *Prionops*, *Laniarius*, and *Thamnophilus* of M. Vieillot, which bring us in contact with the *Thrushes*. The extremes of the family will be found in the *Grauculus* and *Ceblepyris* of M. Cuvier, which by their bills, in some degree depressed at the base, lead back to *Tyrannus* and the other broad-billed groups which commence the family. This last-mentioned genus *Ceblepyris* has latterly been arranged among the *Thrushes*. But I feel inclined rather to leave it in its original station among the *Shrikes*, from the peculiarity of its tail-coverts, which form themselves into a kind of puffed-out cluster on the back. This character seems to prevail among the *Laniadæ* more generally and in a greater degree than in other birds: in one species of the family the *puff-backed Shrike* of Africa, now rendered so familiar to our cabinets from our connection with the Cape, this singular protuberance is carried to so great an extent as to form an apparently artificial appendage to the back. In the genus before us this peculiarity seems even still further developed in the well-known conformation of the same tail-coverts; their shafts being elongated and projected beyond the webs in stiff and sharpened points. On looking to the general affinity which the extremes of this family bear to the *Muscicapidæ*, and through them to the *Fissirostral* birds of the last preceding tribe, we may perceive the character of feeding on the wing carried on to the *Tyranni*, the fork-tailed *Dicruri*, and more particularly to the *Artami*, or the *Pie-grièches Hirondelles* of the continental writers; while the depressed bill of the same *Fissirostral* tribe is partially preserved in the groups just mentioned, together with that of *Ceblepyris*, which meets them at the opposite extreme of the circle of affinity.' [MERULIDÆ; MUSCICAPIDÆ.]

In allusion to the rapacious habits of the *Laniadæ*, Mr. Swainson observes that the comparisons which have been drawn between them and the Falcons are no less true in fact than beautiful in analogy, remarking that many of the *Falconidæ* sit on a tree for hours, watching for such little birds as come within reach of a sudden swoop, when those birds of prey pounce on the quarry, seize it in their talons, bear it to their roost, and devour it piecemeal. These, he adds, are precisely the manners of the true Shrike; yet with all this, the structure of the falcons and shrikes, and their more intimate relations, are so different, that they cannot be classed in the same order, though they illustrate that system of symbolic relationship termed analogy, which, in Mr. Swainson's opinion, pervades creation; but the two groups are, he remarks, in nowise connected, and there is consequently no affinity between them. The following, according to him, are the very decided external characters of the typical groups:—

The short and strong bill is abruptly hooked at the end, and the notch is so deep as to form a small tooth, more or less prominent, on each side: this projection, Mr. Swainson remarks, is analogous to the teeth of quadrupeds, so far as it enables the bird to take a firm grasp of its food, and is used to divide it into pieces: the claws also, as instruments of capture, are peculiarly fine and sharp in the typical group, and this character pervades more or less the whole family. The mode of darting suddenly on their prey (rather than hunting or searching for it) is most prevalent in those groups which are nearest related to the flycatchers, whose general weakness however confines their depredations to the smaller insects: larger and more powerful tribes being the food of the typical Shrikes.

Mr. Swainson arranges the *Laniadæ* in five divisions or subfamilies:—1, The *Tyranninæ*, or Tyrant Shrikes; 2, the *Ceblepyrinæ*, or Caterpillar Shrikes; 3, the *Dicrurinæ*, or Drongo Shrikes; 4, the *Thamnophilinæ*, or Bush Shrikes; and 5, the *Lanianæ*, or true Shrikes. According to Mr. Swainson's views, the first three of these subfamilies constitute the aberrant circle, or that in which the character of the Shrike is least conspicuous. The fourth is the subtypical; and in the fifth the lanine structure is most perfectly developed.

Tyranninæ.

Subfamily Character.—Bill very straight, short, depressed its whole length; the culmen not arched, but the tip abruptly hooked. Nostrils and rictus defended by bristles. Feet short, small, and slender. Lateral toes equal, or very nearly so. Claws long, slender, fully curved, and very acute.

Locality.—America only.

Genera.—*Ptilogonys*, Sw.; *Chrysolophus*, Sw.; *Saurophagus*, Sw., with its subgenus *Megastoma*, Sw.; *Tyrannus*, Vieill., with its subgenus *Milvulus*, Sw.; and *Tyrannula*, Sw.

Mr. Swainson observes that the connection between the family of shrikes and that of the flycatchers (*Muscicapidæ*) by means of the *Tyranninæ* is so perfect, that it is difficult at present to determine where one terminates and the other commences. The water-chats of Brazil pass by such imperceptible degrees into the lesser tyrant shrikes (*Tyrannula*), that, although an observer on the spot might, he remarks, draw a distinction, an ornithologist acquainted only with dried skins is at a loss to distinguish their remote ramifications. 'The water-chats, *Fluvicolinæ*,' says Mr. Swainson in continuation, 'which seem to connect the tyrant shrikes to the fly-catching family, or the *Muscicapidæ*, like very many other tribes, have their plumage black and white variously blended, but without any mixture of green. The lesser tyrants (*Tyrannula*), on the contrary, are all of an olive-coloured plumage; that colour, in short, which is most adapted for concealment among foliage, and therefore suited to their manner of life: between these however we find some curious birds, which borrow the habits of both groups. The species called by Latham White-headed Tody, for instance, is black and white: its general resort is on the sides of marshes, where it perches upon the reeds, and darts on passing insects in the same manner as a true tyrant shrike; this we have ourselves repeatedly witnessed. Azara says that it likewise chases insects upon the ground; so that we have thus in this one bird the manners of both groups exemplified. Whether this, or the *Tyrannula ambulans* of Brazil, which lives on the ground like a lark, constitutes a generic type in this division, is at present uncertain. The lesser tyrants (*Tyrannulæ*) are spread over the whole of America, where they represent the true flycatcher (*Muscicapa*) of the Old World: both have nearly the same manners; and so closely do they resemble each other, that they can only be distinguished by their feet, tail, and wings. From these we may pass to the true or greater tyrants, by a little subgeneric group (*Milvulus*, Sw.) having very long forked tails. The habits of the typical tyrants intimately resemble those of the lesser, but they feed upon larger insects more suited to their own size: some imitate the kingfishers, by diving in the water; and they will even prey upon small reptiles. The species, which are numerous, swarm in tropical America, where they are everywhere seen, perched upon naked branches, and uttering at short intervals a sharp and monotonous cry. The tyrants are bold and quarrelsome birds, particularly during the season of incubation: the male will not then suffer any birds to come near its nest, and becomes so infuriated against such unconscious intruders, that it will attack both hawks and eagles, with a determination not to be resisted, until they are fairly driven away.'

Ceblepyrinæ.

Subfamily Character.—Bill broad at the base, but destitute of long bristles. Rictus nearly smooth. Wings pointed; the three first quills graduated. Feathers on the rump very thick, and apparently spinous. Tail with the centre emarginated, and the sides rounded. Feet short; lateral toes unequal.

Locality.—Warm latitudes of the Old World.

Genera.—*Ceblepyris*, Cuv.; *Oxynotus*, Sw.; *Campephaga*, Vieill., with its subgenus *Phænicornis*, Sw.; and *Erucivora*, Sw.

Mr. Swainson is of opinion that the passage from the tyrant shrikes to the *Ceblepyrinæ* is sufficiently marked by the Mexican genus *Ptiliogonys*, which brings them very close together. The *Ceblepyrinæ* are confined to the Old World; but, according to that author, not a single species had yet been found in Europe. They live upon soft caterpillars, for which they search among the foliage of high trees, as Le Vaillant, who first called attention to the group, pointed out. Mr. Swainson remarks that nearly all the species are distinguished by the feathers on the back, which are very thick set; and when the hand is passed over them in a direction towards the head, they feel as if intermixed with little sharp spines concealed beneath the surface. This singular construction, he adds, is seen also in the Trogons, and, in a less degree, in the families of orioles and cuckoos. The genus *Phœnicornis*, in his opinion, unites this division to the tyrants.

Dicrurinæ.

Subfamily Character.—Bill compressed towards the end; the culmen gradually arched and bent over the lower mandible. Feet short. Tail lengthened, generally forked. Wings long, and more or less pointed.

Locality.—The warm latitudes of the Old World.

Genera.—*Tephrodornis*, Sw.; *Melasoma*, Sw.; *Ocypterus*, Cuv., with its subgenus *Analcipus*, Sw.; and *Dicrurus*, Vieill.

Mr. Swainson holds that we are led to the *Dicrurinæ*, or Drongo Shrikes of Le Vaillant, by those caterpillar-catchers (*Erucivora*, Sw.) which have only a few acute feathers on their back; or that the genus *Oxynotus* may possibly effect this junction. The Drongos, he states, are fly-catching birds, having their bill both compressed and depressed, and the mouth furnished with very stiff long bristles. 'These,' says Mr. Swainson, in continuation, 'are entirely unknown in America, where they seem to be represented by the fork-tailed tyrants (*Milvulus*, Sw.): like them, they have the tail, almost universally, long and forked; and they associate, as do the American birds, in flocks, something like swallows, pursuing insects upon the wing in every direction. Bees appear to be a favourite food with these birds, as they are likewise with the King Tyrant of North America (*Tyrannus intrepidus*). Some are ornamented with little recurved crests in front of the head; others have the neck-feathers pointed, and of a rich metallic hue; most have the tail remarkably developed; and nearly all are of a uniform glossy black colour: hence it becomes very difficult to distinguish the species, which, in truth, are much more numerous than has been generally imagined. In the genus *Analcipus* we first have a few bright colours. Only three species, natives of Madagascar and the Indian Islands, have yet been discovered; they lead us to the swift shrikes (*Ocypterus*, Cuv.), so named from their very long wings; but in *Tephrodornis* these members again become like those of the Drongos. This latter genus is very remarkable; for, by the bristly nature and the incurved direction of the frontal feathers, we have a clear representation of *Chætoblemma*, and all those bristle-fronted birds which are analogical to *Prionops* and *Dasycephala*.'

Mr. Swainson remarks with regard to these three groups, which form, according to him, the aberrant subfamilies of the *Laniadæ*, that the approximation of the *Dicrurinæ* to the *Tyranninæ* has been thought so strong and so decisive, that one ornithologist supposes they actually pass into each other; and he thinks that this union is not only highly probable, but what we should naturally expect; in which case the three aberrant groups would form their own circle.

Thamnophilinæ.

Subfamily Character.—Lateral toes unequal; the outer connected to the first joint of the middle toe. Claws broad, and not very acute. Bill lengthened, abruptly hooked at its tip; the tooth prominent.

Genera.—*Thamnophilus*, Vieill.; *Malaconotus*, Sw.; *Prionops*, Vieill.; *Colluricincla*, Vig.

Mr. Swainson remarks that the habits of the *Thamnophilinæ*, or Bush-Shrikes, are strikingly opposed to those of the aberrant divisions, as he terms them. The Bush-shrikes, he tells us, live among thick trees, bushes, and underwood, where they are perpetually prowling about after insects and young and sickly birds, and are great destroyers of eggs. They neither seize their prey with their claws, nor do they dart at it on the wing; the former therefore are thick and rather blunt, and the wings are so short as to indicate very feeble flight. The bill, which is the capturing instrument, is always stout, much more lengthened than in the true shrikes, and very abruptly hooked at the end, which is armed with a strong tooth.

Only one species of *Prionops* (*P. plumatus*), according to the same author, was known until lately, and that is common in Senegal, where it is said to search for terrestrial insects in humid situations beneath the surface: it has a peculiar crest of rigid feathers falling back on the head, but also reversed over the base of the bill, and completely protecting the nostrils and the sides of the mouth. Mr. Swainson looks upon this bird as forming the point of union between the bush-shrikes and the forked-tailed shrikes, or *Dicrurinæ*, the singular structure above noticed being partially developed in the genus *Tephrodornis*.

Thamnophilus, which Mr. Swainson regards as strictly typical, shows, he observes, the perfection of that particular structure which distinguishes the bush-shrikes. The bill is very powerful; and although many of the species far exceed a thrush in size, others are not much larger than a wren. The group is stated to be confined to the hotter latitudes of America, where the species are very numerous. Though the plumage is thick, the texture of the feathers is very soft and lax. The colours are sombre, but often elegantly varied with dark bands and white spots. Mr. Swainson looks upon the genus *Malaconotus* as representing these birds in Africa; and he observes that, although they were long confounded with them, their distinctions are very decisive, the African group being distinguished for the gaiety and brightness of their plumage; the brightest crimson, combined with glossy black or clear green, with orange or yellow, decorating most of the species. Others however have the sombre colours of the American group, but they are never banded; and a few so nearly approach the *Lanianæ*, that it is very difficult to distinguish them otherwise than by the great inequality of their lateral toes, the inner one being always much shorter than the outer, and the latter often so connected to the middle toe that the feet are partially syndactyle. The Australian genus *Collurisoma* (Colluricincla?), he thinks, probably represents the tenuirostral type.

Lanianæ.

Subfamily Character.—Lateral toes equal and free. Claws slender, acute. Bill generally short, with the tooth very prominent.

Genera.—*Lanius*, Linn.; *Telophonus*, Sw.; *Chætoblemma*, Sw.; *Nilaus*, Sw.; and *Falcunculus*, Vieill.

Mr. Swainson is of opinion that the precise passage between the *Thamnophilinæ* and the *Lanianæ* seems to be effected by the genus *Chætoblemma*, a remarkable form discovered in South Africa by Mr. Burchell. This, Mr. Swainson observes, is the only short-billed shrike that has the frontal feathers stiff and directed forwards upon the base of the bill: in that respect, as well as in the length of its wings, it presents, in his opinion, a curious analogy to *Prionops* among the bush-shrikes.

The same author remarks that as the genus *Lanius* is pre-eminently typical, not only of its own family, but of the whole tribe of *Dentirostres*, or toothed-billed birds, every country in the world possesses examples of it: even in New Holland the true shrikes are, he states, represented by a peculiar type, the *Falcunculus frontalis*, which however, instead of watching for its prey and devouring birds or grasshoppers, by impaling them upon thorns and feeding on them at leisure, like the true shrikes, climbs among the branches of trees and devours the hard-coated beetles which lurk beneath. Here, he observes, is a bird having the form of a shrike and the habits of a woodpecker. This New Holland shrike, as being the scansorial type of the *Lanianæ*, becomes, in Mr. Swainson's opinion, the representative of the titmice, and has the crest and nearly the same coloured plumage as the genus *Parus*. This analogy, according to his views, is further indicated by the great size of the hind toe, which is so unusually large, as at once to evince the climbing habits of the bird, as affirmed by Lewin. Nor is this, in his opinion, the only analogy indicated by the colours of this species; for in the *Bentivi Tyrant* (*Saurophagus sulphuratus*, Sw.), he sees a bird in all its most striking peculiarities of plumage coloured like the *Falcunculus cristatus*, with this difference only, that in one the back is olive-brown, and in the other olive-green. 'Now,' continues Mr. Swainson, 'it is precisely at the point where, according to our theory, the circle of the shrike family is closed; and thus these two genera will stand in juxta-position. Certain however it is that of all the tyrants, the Bentivi is that which most resembles a true shrike, not so much perhaps by its general structure, as by its living upon reptiles, and even carrion, and thus becoming, like the shrikes, both insectivorous and carnivorous.' [BENTIVI.]

Of the two other genera comprised in this subfamily, *Telophonus* and *Nilaus*, the former, according to the same author, bears such a strong resemblance to the typical genus *Lanius*, as well as to *Malaconotus*, that, without a knowledge of the true characters of these three groups, an ornithologist may be much perplexed in detecting their essential differences. 'The genus *Lanius*,' says Mr. Swainson, 'as already mentioned, is chiefly known in its outward appearance by its short and strongly toothed bill: but there is another character equally important, which all writers have hitherto overlooked—this is to be found in the equal length of the lateral toes and the acuteness of the claws. Now this structure of foot is also found, with a diminution hardly perceptible, in *Telophonus*; but then the bill is lengthened, so as to give these birds at the first glance an appearance of being *Malaconoti*. This union of characters is just what we should expect in such birds as were to *represent* the bush-shrikes in the circle of *Lanianæ*; for although the bill is moderately lengthened in *T. collaris*, and remarkably so in *T. longirostris*, still the culmen is regularly curved, and not *abruptly* hooked at the end, as in *Malaconotus*. We have no remaining doubt, in short, of the immediate union of *Telophonus* with the pre-eminently typical genus *Lanius*, this union being effected by the corvine shrikes in one division, and the *Teloph. leucogrammicus* in the other. The second type is *Nilaus*, at present composed but of one species: it has the bill much like that of a true shrike, but considerably attenuated; and the general organization of the bird is weaker than in any other genus. This, we think, is the tenuirostral type of the circle; if so, it will consequently stand between *Chætoblemma* and *Falcunculus*. We have already shown in what respect this latter genus may be viewed as uniting the whole of the shrikes into one circular family; but as we have ventured so far as to trace out the smaller circle of the *Lanianæ*, the ornithologist may well inquire in what manner *Falcunculus* can be actually united to *Lanius*, seeing that its outward structure, no less than its scansorial habits, are so different. Now this union is effected by a singular bird of Brazil, long bandied about (to translate an expressive French phrase) in systems, from the Tanager family to the old genus *Lanius*, and then again to *Thamnophilus*: its structure was so peculiar, that some years ago we placed it as the type of a supposed genus, under the name of *Cyclaris*: a more minute analysis however of this subfamily, and more especially the recent discovery of *Chætoblemma* among the unexamined birds of our friend Mr. Burchell, has quite satisfied us that this is not one of the prominent types of the *Lanianæ*, but only an aberrant species of *Falcunculus*; we therefore cancel the name of *Cyclaris*, and propose for this bird the name of *Falcunculus Guianensis*.'

The following is Mr. Swainson's table of analogies of this family:—

Tribes of Perchers.	Analogies.	Subfamilies of Shrikes.
DENTIROSTRES .	Bill short, toothed; seize their prey with their foot . .	LANIANÆ.
CONIROSTRES . .	Bill lengthened; compressed feet strong; robust . .	THAMNOPHILINÆ.
SCANSORES . . .	Feet very short, hind toe lengthened . .	DICRURINÆ.
TENUIROSTRES .	Bill weak, mouth smooth; feed only on soft substances	CEBLEPYRINÆ.
FISSIROSTRES . .	Bill broad; feed upon the wing . .	TYRANNINÆ.

'Every one,' observes Mr. Swainson, 'must have perceived the resemblance, both in form and habits, between the true shrikes and the falcons, and that *Lanius*, which is the first division or genus, is typical of the whole family. The skulking thievish propensities of the bush-shrikes (*Thamnophilinæ*), and the jays (which belong to the *Conirostres*), in plundering the nests and destroying the eggs of other birds, is thus explained; since it is seen by the above table, that these two groups mutually represent each other. The very great development of the tail in nearly all the Drongo Shrikes (*Dicrurinæ*) is also one of the most remarkable distinctions of gallinaceous birds and of the scansorial tribe, which latter is eminently characterised by the peculiar length of the hind-toe and by the tail-feathers ending in fine points: all these characters are found in the Drongos, but in no other shrikes. The soft and tender food of the caterpillar-catchers (*Ceblepyrinæ*) evinces that even the *Tenuirostres*—a tribe living chiefly upon juices—may be represented by insectivorous shrikes; while the great depression of the bill which has caused the tyrants (*Tyranninæ*) to be confounded with the flycatchers, their constant habit of capturing their prey upon the wing, and the recorded fact that more than one species dives in the water, all remind us of the fissirostral swallows and the aquatic order of *Natatores*.'

Before dismissing his account of this family, Mr. Swainson makes the following remarks upon the genera *Vanga* and *Platylophus*,—two modern genera, he observes, that appear to enter within its limits, but whose true situation he suspects is very different. 'The name of Vanga,' says Mr. Swainson, 'was given by Buffon to a singular and very rare bird of Madagascar, as big as a jay, but with a long abruptly hooked bill like a *Thamnophilus*. It has been usual to place this genus, as well as that of *Platylophus*, in the same group: but when we find that even M. Cuvier joins them with the large bush-shrikes, and several of the African *Malaconoti*, in his genus *Vanga*, we immediately perceive that a group so composed is entirely artificial. The resemblance between *Vanga Destructor* and the smaller species of *Barita*—which latter are obviously crows—is so perfect, that a suspicion has always existed in our mind that both belonged to the corvine family. As we have seen, in the genus *Falcunculus*, a New Holland shrike assume all the manners of a woodpecker, may not *Vanga*, *Barrita* (Barita), &c., by analogy of reasoning, be true crows, disguised under the economy and much of the structure of shrikes? Again, does the *Vangæ* (Vanga) of New Holland and that of Madagascar belong to the same genus, or even to the same natural group? The only specimen of this latter bird known to exist in collections is in the Paris Museum, but in too injured a state to allow of this question being answered. On the other hand we happen to know, from unquestionable testimony, that the *Vanga Destructor* of New Holland kills and eats small birds, in the same manner as the European species; and that it is actually called a butcher-bird by the colonists. Yet this, after all, seems to us only a relation of analogy, just as in the case of *Mniotilta*, which, although it climbs like a *Certhia*, is merely a representation of those scansorial birds, and truly belongs, by affinity, to the circle of warblers. Since our last observations upon *Vanga* were published, we have been fortunate in procuring two or three species, which so connect the New Holland *Vangæ* with *Barrita* (Barita), that we no longer hesitate to place them all in the corvine family (*Corvidæ*); where also we now arrange *Platylophus*, since it certainly has a greater resemblance to *Vanga Destructor* than to any of the soft-backed shrikes or *Malaconoti*. This alteration does not however interfere with anything we have said regarding *Platylophus* being a rasorial type: as such it remains, but merely fills that station in another circle. *Platylophus*, in short, has all the outward aspect of a jay, combined with that of a shrike; while its remarkable crest indicates to which of the primary types of nature we should refer it.' (*Classification of Birds*; see also *Zoological Journal*, vols. 1 and 2; and *Fauna Boreali-Americana*, vol. 2.)

The Prince of Canino, in his *Specchio Comparativo* (1827), places the genus *Lanius* between the genera *Vireo* and *Turdus*. In his *Geographical and Comparative List of the Birds of Europe and North America* (1838), the Prince arranges the *Lanidæ* between the *Muscicapidæ* (its last subfamily being *Vireoninæ*) and the *Corvidæ*. In this arrangement the family consists of the subfamily *Laninæ*, which is composed of the genera *Lanius*, Linn., and *Enneoctonus*, Boie (*Lanius*, Vig.).

Mr. G. R. Gray makes the *Laniadæ* (this fifth family of the tribe *Dentirostres*) consist of but two subfamilies—the *Lanianæ* and the *Thamnophilinæ*.

Lanianæ.

Genera.—*Keroula*, J. E. Gray; *Corvinella*, Less.; *Lanius*, Linn.; *Collurio*, Briss.; *Eurocephalus*, Smith; *Oreoica*, Gould; *Falcunculus*, Vieill.; *Cyclarhis*, Sw.; *Laniellus*, Sw.; *Telophorus*, Sw.; *Niläus*, Sw.; *Napothera*, Mull.; *Prionops*, Vieill.; *Colluriocincla*, Vig. and Horsf.

Thamnophilinæ.

Genera.—*Thamnophilus*, Vieill.; *Cymbilaimus*, G. R. Gray; *Pityriasis*, Less.; *Vanga*, Buff.; *Laniarius*, Vieill.; *Dryoscopus*, Boie; *Chaunotus*, G. R. Gray; *Cracticus*, Vieill.

The *Dicrurinæ* are placed by Mr. G. R. Gray as the last subfamily (the 6th) of the *Ampelidæ;* and the *Tyranninæ* occupy a position as the third subfamily in the family *Muscicapidæ*.

The *Laniadæ* in this author's arrangement come between the families *Ampelidæ* and *Corvidæ* (the first family of his tribe *Conirostres*). (*List of the Genera of Birds*, 1840.)

The European species of *Laniadæ* are *Lanii Excubitor, Meridionalis, Minor, Collurio*, and *rufus*, the two last belonging to the genus *Enneoctonus*, Boie.

We proceed to illustrate this family with the genus *Lanius*.

Generic Character.—Bill very short, strongly hooked; the tooth very prominent. Wings moderate, somewhat pointed. Tail rounded or slightly graduated. Lateral toes free and equal. Claws acute. (Sw.)

Head and foot of Lanius Excubitor.

We select as an example the *Butcher-Bird, Lanius Excubitor*, Linn.

Description.—Old Male.—Head, nape, and back fine bright ash; a large black band passing beneath the eyes and covering the orifices of the ears; lower part pure white; wings short, black; origin of the quills and extremity of the secondaries pure white; two external tail-feathers white; the third black towards the centre, the fourth terminated by a great white space, and the fifth by a less extensive space; the two middle ones entirely black; bill and feet deep black. Length 9 or 10 inches.

The *Young Male* resembles the female.

Female.—Upper parts less bright ash; lower parts whitish, each breast-feather terminated by a crescent of bright ash; less white at the extremity of the secondaries, and more black on the origin of the tail-feathers.

Varieties.—1. Nearly perfect white, only the black parts are lightly shadowed out by deep ash.

2. More or less variegated with white. (Temm.)

This is the *Castrica palombina* and *Averla maggiore* of the Italians; the *Pie-Grièche grise* and *Pie grisatre* of the French; *Torn-Skade* of the Danes; *Warfogel* of the Swedes; *Klavert* of the Norwegians: the *Berg-Aelster, Grossere Neuntoder*, and *Gemeine Würger* of the Germans; *Greater Butcher-Bird* or *Mattagess* of Willughby; *Mountain Magpie, Murdering Pie, Great Grey Shrike, Shreek*, and *Shrike* of the modern British; and *Cigydd Mawr* of the antient British.

Locality.—In England this species is only an occasional visitor, nor are we aware of any instance of its having bred here. 'The Grey Shrike,' says Mr. Yarrell,' has been obtained in several southern and western counties. In Surrey, Sussex, Wiltshire, Dorsetshire, Devonshire, Worcestershire, and Cheshire; and I am informed by Mr. Thompson of Belfast, that it has occurred in one or two instances in the North of Ireland. A specimen shot near Belfast is in the collection of Dr. J. D. Marshall. North of London, it has been killed in Suffolk, Cambridgeshire, Norfolk, Yorkshire, Cumberland, Northumberland, and Durham. No Shrikes appear to have been seen either in the islands of Orkney or Shetland; but the Grey Shrike is included among the birds of Denmark, Norway, Sweden, Lapland, Russia, and Germany. In Holland it is rare; but it is rather a common bird in France, and remains there throughout the year, frequenting woods in summer and open plains in winter. It is an inhabitant also of Spain, Portugal, and Italy.' (*British Birds.*) The Prince of Canino notes it as common near Rome in winter. (*Specchio Comparativo.*)

Habits, Food, &c.—'This Bird,' writes Willughby, 'in the north of England is called *Wierangle*, a name, it seems, common to us with the Germans, who (as Gesner witnesseth), about Strasburgh, Frankfort, and elsewhere call it *Werkangel* or *Warkangel*, perchance (saith he) as it were *Wurchangel*, which literally rendered signifies a *suffocating angel*. In other parts of Germany it is called *Negh-en-Doer*, that is, *Ninekiller* (*Enneactonos*), because it kills nine birds before it ceases, or every day nine. Our falconers call it the *Mattagess*, a name borrowed from the Savoyards, which is by Aldrovandus interpreted a *Murthering Pie*.' Dr. Brookes writes the northern name differently, 'called in Yorkshire and Derbyshire the *Were-Angel*.' The food of this species, which haunts bushes, the skirts of woods and plantations, consists of mice, field-mice, frogs, small birds, lizards, and beetles. 'Although,' says Willughby, 'it doth most commonly feed upon insects, yet doth it often set upon and kill not only small birds, as finches, wrens, &c., but (which Turner affirms himself to have seen) even thrushes themselves: whence it is wont by our falconers to be reclaimed and made for to fly small birds.'

Mr. Yarrell states that the grey shrike feeds upon mice, shrews, small birds, frogs, lizards, and large insects. In the *Portraits des Oyseaux* (1557), where, by the way, it is called *Falconello*, the bird is represented upon a field-mouse, with the following quatrain beneath its likeness:—

> 'Ceste Pie est la moindre de corsage:
> Au demeurant, elle vit de Souris,
> Rats et Mulots, qui sont par elle pris
> Parmy les champs, gastans bled et fourrage.'

So that it seems to have been considered a useful bird in France. It derives its name of *Butcher-Bird* from its habit of suspending its prey, after it has deprived it of life, upon thorns, and so hanging it up, as a butcher does his meat, upon its sylvan shambles. Mr. Yarrell quotes part of a letter from Mr. Doubleday of Epping, who states that an old bird of this species, taken near Norwich, in October, 1833, lived in his possession twelve months. It became very tame, and would readily take its food from its master's hands. When a bird was given to it, it invariably broke the skull, and generally ate the head first. It sometimes held the bird in its claws, and pulled it to pieces in the manner of hawks, but seemed to prefer forcing part of it through the wires, then pulling at it. It always hung what it could not eat up on the sides of the cage. It would often eat three small birds in a day. In the spring it was very noisy, one of its notes a little resembling the cry of the kestrel.

In the *Booke of Falconrie or Hawkinge* (London, 1611) we find *The Matagesse* immediately following 'the Sparrowhawke;' and at the end of 'A generall division of hawks and birdes of prey, after the opinion of one Francesco Sforzino Vyncentino, an Italian gentleman falconer,' we have the following account 'of the Matagasse:'—

'Though the matagasse bee a hawke of none account or price, neyther with us in any use; yet neverthelesse, for that in my division I made recitall of her name, according to the French author, from whence I collected sundrie of these points and documents appertaining to falconrie, I think it not beside my purpose briefly to describe heere unto you, though I must needs confesse, that where the hawke is of so slender value, the definition, or rather, description of her nature and name, must be thought of no great regard,' and then the matagesse is described.

'Her feeding,' continues Turbervile, the writer of *The Booke*, 'is upon rattes, squirrells, and lisards, and sometimes upon certaine birds she doth use to prey, whome she doth intrappe and deceive by flight, for this is her devise. She will stand at pearch upon some tree or poste, and there make an exceeding lamentable crye and exclamation, such as birdes are wonte to doe being wronged, or in hazarde of mischiefe, and all to make other fowles believe and think that she is very much distressed, and standes needefull of ayde, whereupon the credulous sellie birdes do flocke together presently at her call and voice, at what time if any happen to approach neare her, she out of hand ceazeth on them, and devoureth them (ungratefull subtill fowle!) in requital of their simplicity and pains. These hawkes are in no account with us, but poor simple fellows and peasants sometimes do make them to the fiste, and being reclaimed after their unskilful manner, do beare them hooded, as falconers doe their other kinde of hawkes whom they make to greater purposes. Heere I ende of this hawke, because I neither accompt her worthe the name of a hawke, in whom there resteth no valour or hardiness, ne yet deserving to have any more written of her propertie and nature, more than that she was in mine author specified as a member of my division, and there reputed in the number of long-winged hawks. For truely it is not the property of any other hawke, by such devise and cowardly will to come by their prey, but they love to winne it by main force of winges at random, as the round-winged hawkes doe, or by free stooping, as the hawkes of the tower doe most commonly use, as the falcon, gerfalcon, sacre, merlyn, and such like, which doe lie upon their wing, roving in the ayre, and ruffe the fowle, or kill it at the encounter.'

With reference to the art which the matagasse is here said to practise in order to entrap other birds, a device attributed to the butcher-bird by other authors, the communication of a writer in *The Naturalist* becomes interesting. He states that his first acquaintance with this bird was occasioned by hearing notes not entirely familiar to him, though they much resembled those of the Stonechat. Following the sound, he soon discovered the utterer; and, while listening, to his surprise, the original notes were discarded, and others adopted of a softer and more melodious character, never however prolonged to anything like a continuous song.

Sir John Sebright, in his interesting *Observations upon Hawking*, when treating of *Passage Hawks*, states that the slight falcons (*Falco gentilis*) which are brought to this country in the spring, to be used in flying herons, are caught in the preceding autumn and winter on the heaths near Falconsweard, as they pass towards the south and east. These hawks are taken, he tells us, by placing in a favourable situation a small bow net, so arranged as to be drawn over quickly by a long string that is attached to it. A pigeon of a light colour is tied on the ground as a bait; and the falconer is concealed, at a convenient distance, in a hut made of turf, to which the string reaches. A Butcher-Bird (*Lanius Excubitor*) 'that is, the Warder Butcher-Bird, from the look-out that he keeps for the falcon, is tied on the ground near the hut; and two pieces of turf are so set up as to serve him, as well for a place of shelter from the weather, as of retreat from the falcon. The falconer employs himself in some sedentary occupation, relying upon the vigilance of the butcher-bird to warn him of the approach of a hawk. This he never fails to do, by screaming loudly when he perceives his enemy at a distance, and by running under the turf when the hawk draws near. The falconer is thus prepared to pull the net the moment that the falcon has pounced upon the pigeon.'

The nest is generally built on trees, and is framed of grass-stalks, roots, and moss, with a lining of down or wool. The eggs, from four to six, or, according to Temminck, from five to seven, are bluish or greyish white, spotted on the larger end with light brown and ash.

The Butcher Bird, Lanius Excubitor.

In captivity, Bechstein states that, if the bird be captured when it is old, mice, birds, or living insects may be thrown to it, taking care to leave it quite alone, for as long as any one is present it will touch nothing; but as soon as it has once begun to feed freely, it will eat fresh meat, and even become accustomed to the universal paste. An ounce of meat at least is eaten at a meal, and there should be a forked branch or crossed sticks in its cage, across the angles of which it throws the mouse or any other prey, and then darting on it behind from the opposite side of the cage, devours every morsel. The same author states that it may be easily taken if a nest of young birds crying from hunger be suspended to some lime-twigs, and that in autumn and winter it will sometimes dart on birds in cages which are outside the window. Bechstein further remarks that, like the *Nutcracker*, it can imitate the different notes, but not the songs of birds. Nothing is more agreeable, according to him, than its own warbling, which much resembles the whistling of the grey parrot: its throat at the time being expanded like that of the green frog. He adds that it is a great pity that the bird only sings during the pairing season, which is from March to May, and even then often spoils the beautiful melody of its song with some harsh discordant notes.

SHRIMPS, *Salicoques* of the French, a very numerous family of Macrurous decapod crustaceans, whose body is generally compressed laterally, their abdomen very large, and their tegument simply horny.

Family Character.—As in the Astacians, the base of the external antennæ is furnished above with a lamellar appendage; but, in the shrimps, this *lamella* is much larger, nearly always entirely covered, and, generally, far surpasses the peduncle situated below. The *feet* are in general slender and very long, and the natatory false feet are encased at their base by lamellar prolongations of the dorsal segment of the corresponding wings of the abdomen, which descend very low. The caudal fin is large and well formed. The *branchiæ* are always composed of horizontal lamellæ, and are, in general, few in number. (Milne Edwards.)

M. Milne Edwards divides the family into four tribes:—

I. *Crangonians.*

Character of the Tribe.—Internal antennæ inserted on the same line as the external antennæ; first pair of feet terminated by a subcheliform hand.

This division comprises a single genus only; but the crustaceans which compose it differ too much from the other Salicoques to be comprised in the natural tribes formed by them. It corresponds to the genus *Crangon* of Fabricius, which, in the opinion of M. Milne Edwards, has been unnecessarily subdivided by Dr. Leach and M. Risso into the Crangons properly so called, Egeons, and *Pontophili*.

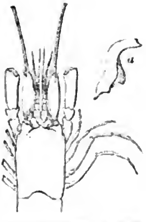
Crangon.

The genus Crangon (Fabr.) comprises those shrimps whose anterior feet are terminated by a monodactylous and subcheliform hand.

Generic Character.—Carapace much more depressed than in the other shrimps, and presenting anteriorly only the rudiment of a rostrum. *Eyes* short, large, and free. *Antennæ* inserted nearly on the same transversal line; the first pair dilated at their base, at the external side of which is a rather large scale; their peduncle is short, and they are terminated by two multi-articulate filaments. The external antennæ are inserted outwardly, and a little below the preceding, and they offer nothing remarkable. The *mandibles* are slender, and without any palp. The external *jaw-feet*, which are pediform, and of moderate length, terminate by a flattened and obtuse joint; within they carry a short palp, terminated by a small flagriform appendage directed inwards. The sternum is very wide backwards. The first pair of *feet* are strong, and terminate in a flattened hand, on the anterior edge of which a moveable claw is bent back: the internal angle of this hand, which corresponds to the point of the claw, is armed with a tooth representing an immoveable rudimentary finger. The two succeeding pairs of feet are extremely slender; the second terminate, generally, in a very small didactylous claw; and the third are monodactylous, like those of the fourth and fifth pairs; but these four posterior feet are much stronger. The abdomen is very large, but presents nothing remarkable in its conformation. The branchiæ are only seven in number on each side of the thorax. (M. E.)

The genus is divided by M. Milne Edwards into the following sections:—

1. Species having the second pair of feet nearly as long as the third pair.



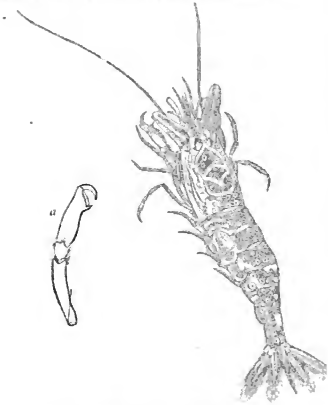
Details of Crangon. *a*, mandible.

In this section are comprised *C. vulgaris*, *C. fasciatus*, and *C. Boreas*. We select the first as an example.

Description of C. vulgaris.—Carapace and abdomen almost entirely smooth, with the exception of one small median spine on the stomachal region, and one lateral above each branchial region. Terminal filaments of the internal antennæ more than twice as long as their peduncle. Lamellar appendage of the external antennæ large and elongated (about twice as long as the peduncle of the internal antennæ). Last joint of the external jaw-feet long and narrow. Two last pairs of feet of moderate size. A strong spine inserted on the sternum, between the second pair of feet, and directed forwards. Abdomen smooth, and without any keel. Median blade of the caudal fin pointed, and without a furrow above. Length rather more than two inches. Colour greenish-grey, dotted with brown.

Localities.—Common on the coasts of England and France.

This is the *Crevette* of the French, and *Shrimp* of our markets, and is one of the most delicious, Pennant thinks the most delicious, of the macrurous crustaceans.



Craugon vulgaris. *a*, anterior foot or claw.

2. Species with the second pair of feet much longer than the third.

Example, *Crangon septemcarinatus; Sabinea septemcarinata*, Ross

Sabinea. (Ross.)

Generic Character.—*Upper antennæ* with two filaments inserted nearly on the same horizontal line; the interior longest. *Lower antennæ* shorter, a scale externally unidentate at the apex annexed to the peduncle; the first joint not prolonged to the middle of the scale.

Palps pediform, the four joints exserted; the two last equal in length.

Feet ten; the anterior pair subcompressed, subdidactylous; the second pair very short, thin, inunguiculate; third pair thin, furnished with a single claw; fourth and fifth pairs thicker than the preceding, furnished with compressed claws. (Ross.)

Example, *Sabinea septemcarindta; Crangon septemcarinatus*, Sabine.

Captain James Ross states, in the Appendix to Sir John Ross's 'Second Voyage,' that owing to the peculiar formation of the second pair of legs in this singular animal, it has become necessary to establish a new genus, which he dedicates to Major Sabine, by whom it was discovered on the coast of Davis's Straits, during Sir Edward Parry's first voyage to those regions.

The following is Major Sabine's *Description.*—Length four inches; colour varied, red and white above, white beneath. Thorax seven-carinate, the three lateral carinæ on each side serrate, the middle one with strong spines; rostrum short, curving down between the eyes, grooved in the centre; the five upper carinæ carried on in very faint rudiments along the back; the terminal setæ of the superior antennæ inserted nearly in the same horizontal line, the interior one being the longest; the first joint of the inferior antennæ scarcely produced beyond the middle of the squama; a strong spine on the abdomen directed forward between the chelate legs; the last joint of the pediform palpi subacuminate, rather longer than the preceding; second pair of legs slender, very short, bristled and uncovered, in which last essential point it differs from the *Pontophilus spinosus* of Leach, *Mal. Pod. Brit.*, t. 37, to which, in other respects, this species bears a near resemblance.

Localities.—Rarer in the Arctic Seas than *Crangon Boreas;* several taken on the west coast of Davis's Straits; a few specimens obtained near Felix Harbour; near the island Igloolik in considerable numbers.

M. Milne Edwards remarks that the genus *Mesocarpus* of Rafinesque appears to bear some analogy to *Crangon*, but that it has been too imperfectly characterized to permit its occupation of a place in a natural method.

II. *Alpheans.*

The shrimps comprised by M. Milne Edwards under this tribe are stouter in their forms than those of the succeeding division, but they are not depressed as the Crangons are. The rostrum is very short, and has never the form of a great projecting central blade, as in the Palemonians. The *internal antennæ* are placed above the external antennæ, and are, in general, very short. One pair of feet is very stout, and generally terminated by a powerful didactylous hand. The two anterior pairs of feet are nearly always didactylous, but the third pair never are; the three last pairs are rather robust, and serve for walking as well as for swimming.

The genera included by M. Milne Edwards under this tribe are *Atya*, *Hymenocera*, *Alpheus*, *Pontonia*, *Autonomea*, *Caridina*, *Nika*, and *Athanas*.

Atya. (Leach.)

Generic Character.—See the article.

Localities.—Coasts of Mexico. (M. E.)

Hymenocera. (Latr.)

See the article.

Alpheus. (Fabr.)

Generic Character.—*Carapace* advanced above the eyes, forming above each of those organs a small vaulted buckler. *Rostrum* very small, and sometimes wanting. In other respects the carapace presents nothing particular. The *superior antennæ* are small, their first joint short, and armed externally with a lamina, which is ordinarily spiniform; the two next joints are cylindrical; and of the terminal filaments, two in number, the upper one is stouter and shorter than the lower, and presents traces of a division near the end. The *inferior antennæ* are inserted externally to and below the preceding: the lamellar palp is of moderate size, or even sometimes small and pointed, and their terminal filament presents nothing particular excepting that it is often somewhat compressed. The *mandibles* are provided with a short palpiform appendage, which is wide and flattened. The form of the *external jaw-feet* varies a little: sometimes they are slender and elongated, in other cases of moderate length, and terminated by a widened and nearly foliaceous joint. The two first pairs of *feet* are didactylous; the anterior feet strong and terminated by a large convex hand, the form and dimensions of which differ much on the opposite sides of the body. The second pair of feet are slender and filiform, their hand is rudimentary, and their carpus multi-articulate. The last three pairs are monodactylous, and of a moderate length. The *abdomen* is large, and its false feet elongated.

Geographical Distribution.—The seas of warm climates. Some species are found in the Mediterranean, but the greater part in the seas of the Antilles or in the Indian Ocean. (M. E.)

M. Milne Edwards separates the Alpheans into the following sections and subdivisions :—

1. Species with a pointed rostrum.

A. No spine at the outside of the basilary joint of the external antennæ.

Example, *Alpheus ruber*.

Description.—Closely approximating *Alpheus brevirostris*, a species from the coasts of New Holland, but with the body very slender; the large claw with four longitudinal obtuse crests or ridges, two of which are on its superior border, and two on its external surface; its lower border obtuse; the moveable finger much shorter than the immoveable one; a spine on the superior border of the two arms, at some distance from the termination. Length 15 lines.

Locality.—The Mediterranean. (M. E.)

B. A great spine fixed on the external border of the basilary joint of the external antennæ, and directed forwards.

Example, *Alpheus villosus*.

Description.—Body covered with a rather close down; a small median crest armed with a median spine at the base of the rostrum, which is a little inflected; a rudimentary spine on the anterior border of the orbital vaults. Second joint once and a half the length of the first. Lamellar appendage of the external antennæ very narrow, and scarcely passing beyond the peduncle of those organs; lateral spine of the basilary joint very long. External jaw-feet large, strong, wide towards the end, and furnished with large bunches of long and stiff hairs. Anterior feet convex, very unequal; the great right hand granulose and very hairy above, a little turned upon itself, hollowed by a longitudinal profound furrow on the anterior half of the external surface, and terminated by an immoveable, obtuse, and very short finger; the thumb equally obtuse and very much curved. Feet very small, but cylindrical and elongated. Length about 2 inches.

Locality.—The seas of New Holland. (M. E.)

2. Species deprived of a spiniform rostrum.

Example, *Alpheus frontalis*.

Description.—*Carapace* slightly carinated at its anterior part. *Front* very much advanced, nearly triangular; orbital vaults projecting very much; second joint of the internal antennæ slender and elongated. Lamellar appendage of the external antennæ less long than their peduncle; no lateral spine at the base of those organs. External jaw-feet very short, but rather wide towards the end. Anterior feet smooth and very unequal; the stout hand convex, the small one more or less compressed. Length about 20 lines.

Locality.—Coasts of New Holland. (M. E.)

M. Milne Edwards records twelve species of Alpheus.

Pontonia. (Latr.)

Generic Character.—*Carapace* short and convex; the *front* with a short but robust and inflected rostrum; the *eyes* are cylindrical, projecting, and very moveable. The internal antennæ are very short, and formed very nearly like those of the Palemons or Prawns; the first joint of their pedicle is very wide and lamellar externally; the two succeeding joints are small and cylindrical. The terminal filaments, two in number, are very short, and the one between them is bifid at the extremity. The external antennæ are inserted above and external to the preceding; their lamellar appendage is large and oval. The external jaw-feet are small and very narrow throughout their length. The four first pairs of feet are didactylous; the first pair are slender and terminated by a well-formed but very small hand; the hands of the second pair are, on the contrary, very large and of very unequal size, sometimes the left is largest. The succeeding feet are moderate, monodactylous, and terminated by a nearly rudimentary tarsus. The *abdomen* is large, especially in the females, and presents a conformation very analogous to that which exists in the Palemons; it is however to be remarked that the median blade of the caudal fin bears no spines on its upper surface. The *branchiæ*, which are well developed, are only five on each side, those fixed above the appendages of the mouth being rudimentary, and the first rings of the thorax supporting only one pair. (M. E.)

M. Milne Edwards divides the *Pontoniæ* into the following sections :—

1. Species with the rostrum very large and depressed, and the external antennæ inserted nearly on the same line as the superior antennæ.

Example, *Pontonia macrophthalma*.

Description.—Carapace nearly as wide as it is long. Rostrum triangular; eyes very large and remarkably projecting; a small spine on the outside of the basilary joint of the external antennæ. External jaw-feet very short. Second pair of feet very large, differing but little; hand nearly as large as the claviform body, and terminated by a claw, the immoveable finger of which is pointed and armed with a large tubercle, and the moveable finger stout and nearly semilunar. Abdomen narrow. Length about ten lines.

Locality.—Asiatic seas, where it was found by M. Dussumier. (M. E.)

2. Species with the narrow rostrum very much compressed laterally, and inflected towards the point; the external antennæ inserted entirely below the superior antennæ.

Example, *Pontonia armata*.

Description.—Carapace armed with a small spine near the base of the external antennæ, and depressed near the insertion of the eyes; rostrum not advanced beyond the half of the length of the scale of the external antennæ. Abdomen very stout. Second pair of feet moderate, and but slightly convex. Length nearly two inches.

Locality.—New Ireland, where it was found by MM. Quoy and Gaimard. (M. E.)

Autonomea. (Risso.)

Generic Character.—*Antennæ* intermediate or superior, terminated by two filaments, one of which is much longer and thicker than the other; external or inferior antennæ longer than the body, and setaceous. Peduncles of the first inarticulate, having their lower portion convex and armed with a spur, the intermediate long and cylindrical, and the last short and bent. Those of the second bi-articulate, without scales, their second portion being hairy at its extremity. External *jaw-feet* not foliaceous. First pair of *feet* only didactylous, very large, thick, unequal; the others very short, very delicate, and terminating in simple hooks. *Body* elongated, smooth. *Carapace* slightly convex, terminated anteriorly by a sharp point at the *rostrum*, which hardly advances beyond the eyes, which are globular and supported on very small peduncles. The three intermediate natatory plates of the extremity of the *abdomen* truncated at the summit with a small point on each side, the two lateral plates rounded and ciliated. (Desm.)

Example, *Autonomea Olivii*.

Description.—Length 15 lines; general form that of *Nika* and *Alpheus*. Carapace smooth, demi-transparent, yellowish, slightly varied with reddish tints; first pair of feet fine red above, and bright yellow below; external antennæ whitish.

Locality.—The Adriatic Sea, and, rather rarely, at the environs of Nice, where it lives solitary in the sea-weed and muddy places; the female carries her reddish eggs about the middle of the summer. (Desm.)

Caridina. (M. E.)

Generic Character.—*Carapace* presenting nothing particular, and terminating by a lamellar rostrum varying in length. *Eyes* projecting. *Internal antennæ* very long, and terminated by two large multi-articulate filaments, one of which is convex at its base; external antennæ formed like those of the Palemons. External jaw-feet long, slender, and pediform. Two first pair of feet didactylous; the anterior very short and presenting a remarkable disposition. The carpus is nearly triangular, and terminates anteriorly by a concave border, which receives the base of the hand fixed at its lower angle; the hand is short and terminated by two lamellar fingers deeply hollowed into a spoon shape. The second pair of feet are longer and more slender; the carpus is of the ordinary form, but the hand is formed like that of the preceding member. The three last pairs of feet are slender and nearly of the same length. *Abdomen* formed as in the Palemons. (M. E.)

Example, *Caridina Typus*.

Description.—Rostrum sharp, straight, moderate, not attaining the extremity of the second joint of the internal antennæ, and armed below with three small teeth. Anterior feet shorter than the external jaw-feet. Extremity of the claws furnished with much hair. Length about 10 lines. (M. E.)

M. Milne Edwards is of opinion that this tribe establishes the passage between *Pontonia* and *Atya*, and seems to bear some analogy to *Hymenocera*.

Nika. (Risso.)

Generic Character.—M. Milne Edwards observes that this genus is remarkable for the defect of symmetry in the conformation of the two first pairs of feet. In their general form, he remarks, they resemble the Palemons, or rather, the genus *Athanas*, for their *rostrum* is very small. Their internal *antennæ* are slender, and terminated, as in these last, by two rather long filaments. The external *jaw-feet* are pediform, long, and stout: the joint which terminates them is pointed at the end. The anterior *feet* are stronger than those which succeed, but of moderate length; the anterior right limb has a well-formed didactylous hand, whilst that opposed to it is monodactylous and formed after the manner of ambulatory feet. The second pair of feet are filiform, and terminated by a small pincer, which is nearly rudimentary; their carpus is multi-articulate, and their length very different; the left is nearly twice the length of the anterior feet, and the right is nearly twice the length of its opposite. The succeeding feet are monodactylous, and terminated by a styliform tarsus, which is not spiny; the fourth pair are longer than the third. The *abdomen* has the same form as in the *Palemonians*.

Example, *Nika edulis*.

Description.—Rostrum slightly inflected, and nearly of the length of the eyes. A small tooth on each side, on the anterior border of the carapace, below the insertion of the eyes. Anterior jaw-feet very large, their antepenultimate joint passing beyond the lamina of the external antennæ. The monodactylous foot of the first pair less than the didactylous foot. Median lamina of the caudal fin hollowed into a longitudinal furrow, and furnished above with two pairs of small spines. Length about two inches.

Localities.—The Mediterranean and the English Channel. (M. E.)

Athanas. (Leach.)

Generic Character.—*Carapace* not elevating itself into a carina at the base of the *rostrum*, as in the *Palemonians*; the rostrum itself not toothed on its edges. *Eyes* projecting but little, but not covered by the carapace, as in *Alpheus*. *Internal antennæ* rather large, and terminating by three multi-articulate filaments, disposed as in *Palemon*, as are the *external antennæ* also. *Mandibles* robust, with a palpiform, short, but very large appendage composed of two joints. *External jaw-feet* slender and short. First pair of *feet* long and very strong, unequal, and terminating by a large didactylous hand, the pincers of which are short and robust. Second pair of feet filiform, and ordinarily bent (reployées en deux); their carpus is much elongated and multi-articulate, and they terminate in a very small and very weak didactylous hand. The three succeeding pairs of feet are monodactylous, and present nothing remarkable. *Abdomen* not gibbous; each of the *false feet* supporting two large lanceolate laminæ. External laminæ of the *caudal fin* with a transverse articulation as in the *Astacians*. (M. E.)

Example, *Athanas nitescens*.

Description.—Rostrum sharp, shorter than the peduncle of the internal antennæ; a spine on each side of its base, on the anterior border of the carapace. Hands unequal, convex, and with short and obtuse fingers. Carpus of the second pair of feet divided into five or six joints. Median lamina of the caudal fin carrying on its upper surface four spines; posterior border of the four lateral pieces dentilated. Length about an inch.

Localities.—Coasts of France and England. (M. E.)

III. *Palemonians.*

Character of the Tribe.—*Body* laterally compressed, but the *abdomen* never sharp as in the *Peneans*. *Thorax* large. *Carapace* armed in front with a great sabre-like *rostrum*, nearly always dentated above. *Antennæ* placed as in the preceding tribe, but longer, and the first pair often with three terminal filaments. All the *feet* are slender, and the two first pairs are, generally, didactylous, whilst the three last pairs are never didactylous. The *abdomen* is of great size, but far less than that of the *Peneans*. (M. E.)

Genera.—*Gnathophyllum*; *Hippolyte*; *Rhynchocinetes*, *Pandalus*; *Lysmata*; and *Palemon*.

Gnathophyllum (Latreille. *Drimo*, Risso).

Generic Character.—*Rostrum* short but compressed, lamellar, and dentilated on its superior edge. Upper *antennæ* terminated by very short filaments, and blade of the lower antennæ rather large and oval. The *external jaw-feet* are foliaceous and formed nearly like those of *Callianassa*, and their second and third joints are enlarged so as to form a great operculum which covers the whole of the mouth, and carries in front a small slender stem formed of the two last joints. Two first pairs of *feet* moderate and terminated by a didactylous hand; the three last pairs monodactylous, of moderate length, and terminated by a small dentated tarsus. *Abdomen* presenting nothing remarkable. (M. E.)

Example, *Gnathophyllum elegans*.

Description.—Carapace convex, rostrum oblique, and armed above with from six to seven teeth; second pair of feet rather longer and stouter than the first pair: terminal blades of the abdomen oval. Length about 20 lines.

Locality.—Nice.

Hippolyte. (Leach.)

Generic Character.—General form of the body resembling that of *Palemon*, but their *abdomen* is incapable of being completely straightened, and appears, in some degree, to be humped; *rostrum* very large, compressed, and nearly always strongly dentated; *internal antennæ* small, and terminated only by two multi-articulate filaments nearly of equal length, one of which is very large and strongly ciliated; *external antennæ* inserted under the preceding, and presenting nothing remarkable; *external jaw-feet* slender and elongated: *feet* formed nearly in the same manner as those of *Lysmata*, only that they offer no appendage at their base; the first pair are short, but rather stout; the second are filiform, terminated by an extremely small didactylous hand, and have a multi-articulate carpus; the three last pairs of feet are rather long, and in general very spiny at the end; the terminal plates of the natatory *false-feet* are lanceolate, dentilated on their edges, and ciliated all round; *branchiæ* seven on each side. (M. E.)

The species, which are rather numerous, and all small in size, are divided by M. Milne Edwards into the following sections:—

1. Species whose rostrum springs from the front and is not continued backwards, with an elevated crest occupying the median line of the carapace.

Example, *Hippolyte varians*.

Description.—Rostrum passing beyond the peduncle of the internal antennæ, straight, slender, and armed with two teeth above—one situated at its base, and the other near its extremity—and two below, situated a little behind the last superior tooth; a small spine on each side of the base of the rostrum, above the insertion of the eyes; first joint of the internal antennæ armed externally with a spine of moderate size; lamellar appendages of the external antennæ large, passing a little beyond the rostrum, and oval, or rather truncated obliquely from within outwards, and from before backwards at their extremity; external jaw-feet short, passing only slightly beyond the peduncle of the antennæ, and terminated by a short flattened joint, which is truncated and spiny inwards; anterior feet very short, hardly reaching beyond the basilary joint of the external antennæ; second pair moderate, shorter than the third, and having the carpus divided into three or four indistinct segments; median blade of the caudal fin with two pairs of small spines on its upper surface. Length four or five lines.

Localities.—The British Channel and the coasts of La Vendée. (M. E.)

2. Species whose rostrum forms an elevated crest on the anterior part of the stomachal region, but is not prolonged on the posterior part of the carapace.

Example, *Hippolyte crassicornis*.

Description.—Carapace rounded above; rostrum very small, rather elevated at its base, but taking its origin close to the insertion of the eyes, and not reaching to the extremity of those organs, inflected at first, then straight, bifid at the end, and armed above with two or three dentilations; eyes very large; internal antennæ remarkably stout, their basilary joint dilated and lamellar below; the two succeeding joints spiny, and the upper terminal filament extremely stout and furnished all round with long thick hairs; lamellar appendage of the external antennæ short and oval; external jaw-feet long (reaching beyond the lamellar appendage of the external antennæ), and having the last joint slender and cylindrical; anterior feet not reaching beyond the peduncle of the external antennæ; the second pair of the same length as the third, and having the carpus divided into many segments; four pairs of spines on the upper surface of the median blade of the caudal fin. Length four lines.

Locality.—St. Malo. (M. E.)

3. Species the base of whose rostrum is elevated into a crest and prolonged to the posterior edge of the carapace.

Example.—*Hippolyte gibberosa.*

Description.—Rostrum taking its origin from the posterior third of the carapace, very much bent and armed with four or five teeth at its base, then curving strongly upwards, and only presenting one small spine towards the level of the extremity of the eyes, and two or three dentilations at its point; its lower border descending very low at its base and armed with six or seven teeth, the posterior of which are very strong; lateral spine of the internal antennæ very large; lamellar appendage of the external antennæ nearly triangular; external jaw-feet short and truncated at the end; anterior feet very small and scarcely reaching beyond the peduncle of the external antennæ, the second pair longer than the third and having the lower part of the carpus divided into a great number of joints. Length about eighteen lines.

Locality.—The coasts of New Holland. (M. E.)

Rhynchocinetes. (Edwards.)

Generic Character.—M. Milne Edwards observes that this genus is closely approximated to *Hippolyte*, but that it is distinguished from all the other macrurous crustaceans by the singular conformation of the *rostrum*, which, instead of being a simple prolongation from the front, is a distinct lamina of the carapace, and articulated with the front so as to be very moveable, and to possess the power of lowering itself above the antennæ, or of elevating itself vertically; in other respects it much resembles the rostrum of *Hippolyte*. It is very large, sabre-shaped, and dentilated on both edges. *Eyes* projecting, and, when bent forward, lodged in an excavation of the peduncle of the superior antennæ, the basilary joint of which is large and armed externally with a spiniform lamina; terminal filaments two in number and formed as in *Hippolyte;* the lamellar appendage of the external antennæ large and triangular; *external jaw-feet* pediform and elongated—the last joint slender, cylindrical, and spiny at the end; *feet* like those of *Hippolyte*, except that at the external side of the base of each there is a small, palpiform, rudimentary appendage, and that the tarsi of the second pair is not multi-articulate; *abdomen* presenting nothing remarkable; *branchiæ* seven on each side. (M. E.)

Example, *Rhynchocinetes Typus.*

Description.—Front armed with three spines, of which the median, placed above the base of the rostrum, is followed by another median spine; rostrum very large, longer than the lamina of the external antennæ, armed above with two spines situated near the base, and with seven or eight dentilations situated at its extremity; its inferior border furnished with a score of very large teeth; external jaw-feet of the same length as the rostrum; anterior feet larger than the others and reaching a little beyond the peduncle of the external antennæ; pincers short and hollowed into a spoon-shape; moveable finger dentilated; second pair of feet as long as the first pair, but much shorter than the third; three pairs of small spines on the upper surface of the median blade of the caudal fin. Length about two and a half inches.

Locality.—The Indian Ocean. (M. E.)

Pandalus. (Leach.)

Generic Character.—Closely resembling *Palemon* in the general form of the body, but distinguished from that genus by the conformation of the feet, of which the two anterior are monodactylous. *Carapace* armed in front with a very long compressed rostrum, which is elevated towards the end, and dentilated both above and below. *Eyes* large, short, and free. Upper *antennæ* formed nearly like those of *Palemon*, excepting that they possess only two terminal filaments. External *jaw-feet* slender and pediform. *Feet* slender, the first pair shortest, and terminated by a styliform joint; the second pair filiform, and terminated by a very small didactylous hand; their carpus multi-articulate, Succeeding feet presenting nothing remarkable. Disposition of the *abdomen* the same as in *Palemon*. Number of *branchiæ* 12 on each side of the body. (M. E.)

Example, *Pandalus annulicornis.*

Description.—Rostrum of the length of the carapace, armed above with some ten teeth, which occupy the stomachal region and the posterior half of its fore part; a small tooth near the point of the rostrum, separated from the preceding by a rather long smooth space; interior border of the rostrum armed with from seven to eight very large teeth towards its base, and the last of which are placed towards the extremity. Feet rather strong, and of moderate length; first pair not attaining to the extremity of the lamellar appendage of the external antennæ; three last pairs of feet armed with spines. Length of the body about two inches.

Localities.—Coasts of England and Iceland. (M. E.)

Lysmata. (Risso.)

Generic Character.—Resembling very much the Palemons, and establishing the passage between them and *Hippolyte;* they have their general form, and their carapace is equally armed with a long, compressed, and dentilated rostrum. *Internal antennæ* terminating also in three multi-articulate filaments, two of which are long, and one very short. The *external antennæ* are inserted under the first, and present nothing remarkable. The *mandibles* are deprived of a palpiform appendage. The two first pairs of *jaw-feet* have at their base a membranous vesicle formed by the flabelliform appendage modified. The external jaw-feet are slender, and present nothing remarkable. The *feet*, as well as the jaw-feet, carry a small horny blade fixed to their basilary joint, and represent the flagrum, which in the crawfishes is situated in like manner, but acquires very considerable dimensions. First pair of feet of moderate length, rather robust, and terminating in a small didactylous hand, but they are filiform and very long. Their hand is rudimentary; and their extremely long carpus is divided into a multitude of small joints. The three succeeding pairs monodactylous, and formed in the ordinary manner, excepting that at their base is found the vestige of a flagrum. Disposition of the *abdomen* the same as in the Palemons. The *branchiæ* seven on each side, the five last rather large, and fixed to the thorax above the five thoracic feet; but the two anterior are placed one upon the other above the external jaw-feet, and are rudimentary. A tubercle situated at the base of the second and third pairs of jaw-feet may also be the vestige of a branchia. (M. E.)

Example, *Lysmata seticordata.*

Description.—Rostrum taking its origin towards the middle of the carapace, a little inflected towards the end, not attaining the extremity of the peduncle of the internal antennæ, and armed with six teeth above and two below. Two of the filaments of the superior antennæ as long as the body. External jaw-feet reaching beyond the lamellar appendage of the external antennæ, and nearly of the length of the anterior feet, the hand of which is small. Second pair of feet twice as long as the preceding, and habitually bent double; their carpus extremely long. Length about two inches. Colour red-brown, striped longitudinally with white.

Locality.—The Mediterranean. (M. E.)

Palemon. (Fabr.)

Generic Character.—*Body* compressed but little, and generally rounded above. *Carapace* moderate in size, and presenting towards its anterior third a median crest, which is the origin of the *rostrum;* this last advances above the base of the eyes and antennæ, and presents nearly always a considerable length; it is very much curved upwards towards the end, and strongly dentilated on its upper and lower borders. *Eyes* large and projecting. *Internal antennæ* inserted above the external ones; the first joint of their peduncle very large, depressed, excavated upon its upper surface for the lodgement of the eyes, and armed externally with a strong spine, which occupies its anterior angle. The two succeeding peduncular joints stout and cylindrical. The multi-articulate filaments which terminate these organs are three, two of which are in general extremely long, and one very short and joined by its base to one of the preceding. The *external antennæ* are inserted below, and rather external to the internal antennæ; the lamellar palp which covers their base is very large, oval, rounded, and ciliated at the end, and armed with a spine at its external border. The *mandibles* carry a small, cylindrical, palpiform appendage, and the external *jaw-feet* are of moderate length, slender, sometimes unguiculated at the end, and sometimes terminated by a small multi-articulate appendage. *First pair of feet* slender, terminated by a small didactylous hand, and presenting near their base on the internal side a small dilatation, which covers the mouth, and acts after the manner of jaw-feet. *Second pair of feet* much longer and stronger, terminated also by a well formed didactylous hand, and with the carpus entire and formed in the ordinary manner. Three succeeding pairs slender and monodactylous, their length diminishing progressively, and without any vestige at their base of flagrum or palp. *Abdomen* very large, and narrowing gradually towards the end; its upper surface regularly arched, but capable of becoming nearly completely straight, without any hump as in *Hippolyte*. The seventh segment, which forms the median piece of the caudal fin, is triangular and shorter than the lateral blades; it is generally armed with some spines at its extremity, and there are on the upper surface five small spines, the anterior of which is situated on the median line, and the others laterally. The lateral blades of the caudal fin are very large, oval, and nearly of equal size. The abdominal false feet are very large; the first pair carry a large ciliated blade, and a second smaller one; the others are provided with two ciliated blades, nearly of the same size, of which the internal one carries towards its base a small cylindrical appendage. (M. E.)

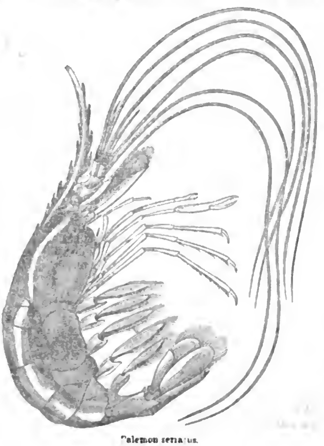
M. Milne Edwards remarks that the nervous system of the Palemons presents a much greater concentration than that of the crawfishes (Ecrevisses); for all the thoracic ganglions are approximated so that they nearly touch each other. The branchiæ, he observes, are eight in number on each side of the body.

The species of this useful and delicious genus are numerous. M. Milne Edwards records 17, besides the Indian *Palemon brevimanus* and *Palemon Coromandelinus* of Fabricius. Those of our own coasts are well known to the epicure; and some of the species which are found in warm climates attain to a considerable size; such are the *Palemon Carcinus* of the Indian seas and the Ganges, which attains to nearly a foot in length, and the *Palemon Jamaicensis* of the Antilles, which is from 10 to 12 inches long.

The prawns generally inhabit sandy bottoms near the coasts, but some are found at the mouths of rivers, and far up. They mostly boil red.

M. Milne Edwards subdivides the species into the following sections:—

1. Species having the anterior border of the carapace armed on each side with two spines, situated one above and the other below the insertion of the external antennæ.



Palemon serratus.

Example, *Palemon serratus*.

Description.—Rostrum reaching much beyond the lamellar appendage of the external antennæ; very much elevated towards the end, and bifid at its extremity; its superior border smooth for nearly its anterior half, and armed on the rest of its extent with from seven to eight teeth; the crest which occupies its inferior border very wide at its posterior extremity, and armed with five or six teeth. The small terminal filament of the superior antennæ very short, not attaining the extremity of the rostrum when it is directed forwards, nor the anterior border of the carapace when it is directed backwards. External jaw-feet only a little passing beyond the peduncle of the external antennæ; their palp very short. Anterior feet not attaining the lamellar appendage of the external antennæ, the second pair reaching but little beyond that *lamella*; and the third pair, when they are bent forward, not reaching it at all. Hands of the second feet hardly convex; their pincers nearly of the length of the carpus. Length from 3 to 4 inches. Colour greyish with small red and brown spots.

Locality.—The coasts of France and England.

This is the *Astacus serratus* of Pennant; *Cancer Squilla* of Herbst; *The Prawn* of the shops.

N.B. There are two other *Prawns* which inhabit our coasts: one, the *Palemon Squilla* and *Astacus Squilla* of Fabricius, with a much shorter rostrum, not reaching beyond the lamellar appendage of the external antennæ, nearly straight, and dentated to the top, and about 20 lines long altogether; the other, *Palemon varians*, with a very short rostrum armed with from four to six teeth above, and only two or three below, and about one half the size of the last.

For the parasite (*Bopyrus*) which infests prawns, see Isopoda, vol. xiii., p. 51.

2. Species having the anterior border of the carapace armed on each side with a single spine.
   - A. A second spine situated behind the preceding, nearly on the same horizontal line.
     - A**. Prehensile borders of the pincers nearly straight, and touching each other throughout their length.

Example, *Palemon Carcinus*.

Description.—Rostrum very long, passing much beyond the lamellar appendages of the external antennæ, strongly curved upwards on its anterior half, and armed with twelve or fourteen teeth on its lower border; one very strong tooth at the anterior border of the carapace, near the insertion of the external antennæ, followed by a second tooth not so large, situated a little below its base. External jaw-feet very short, hardly advancing beyond the peduncular portion of the external antennæ. First pair of feet attaining the extremity of the rostrum; second pair cylindrical, covered, in the male with small short spines—in the adult male they are longer than the body, and their third joint passes beyond the lamellar appendage of the external antennæ, carpus nearly of the length of the palmar portion of the hand; pincers cylindrical, a little hooked at the end; the immoveable finger furnished with a small corneous crest, which is received in a furrow of the moveable finger, which is stouter than the first, and covered with a very close brownish down. Three succeeding feet rather rugose above, their tarsus short and triangular. Last segment of the abdomen terminated by a sharp point, at the base of which on each side is a rudimentary spine. Length sometimes nearly a foot.

Localities.—The Indian seas and the Ganges.

A**. Prehensile borders of the pincers concave, so as to leave a space between them.

Example, *Palemon spinimanus*.

Description.—Rostrum nearly straight, shorter than the peduncle of the internal antennæ, and armed with thirteen or fourteen small teeth above, and three or four below. Second pair of feet unequal, and very spinous; a row of very large curved and closely approximated spines on the upper border of the hand, and a great number of long flexible hairs on its internal surface; pincers short, stout, and arched, so as to leave a great space furnished with hairs between them. Length about four inches.

Localities.—The Antilles and the coast of Brazil.

AA. No second spine situated at the base or behind that with which the anterior border of the carapace is armed on each side.

Example, *Palemon Gaudichaudi.*

Description.—Body stout and thick. Rostrum extremely short, not reaching beyond the first basilary joint of the internal antennæ, incurved, and armed with from seven to eight very small teeth above, and two or three below, all near its extremity. A single tooth on each side of the carapace. Lamellar appendage of the external antennæ very short. Second pair of feet convex, very unequal and rough, with short points in small individuals, but becoming long as the animal advances in age; pincers stout, and as long as the palmar portion of the hand. Succeeding feet very short. Last segment of the abdomen very short, rounded at the end, and without any spines worthy of remark. Length from four to five inches.

Locality.—Chili.

IV. *Peneans.*

In this tribe M. Milne Edwards comprises those shrimps whose abdomen is in general extremely elongated, and whose feet often carry at their base a palpiform appendage more or less developed. The rostrum is short, or nearly null, and the lower antennæ, if not both pairs, are nearly always very long. The conformation of the feet varies much; but generally these organs become for the most part so slender and long that they cannot serve except for swimming, and sometimes the last pairs become rudimentary or disappear.

Genera.—*Stenopus; Sicyonia; Penæus; Euphema; Ephyra; Oplophorus; Pasiphæa; Sergestes; Acetes.*

Stenopus. (Latr.)

Generic Character.—*Body* not compressed laterally, and teguments comparatively soft. *Carapace* terminated anteriorly by a small rostrum. *Eyes* short, and disposed in the ordinary manner. Peduncle of the superior *antennæ* slender, and not carrying any lamellar appendage, as in the *Penæi;* terminal filaments of those organs long and cylindrical, and two in number. Lower antennæ presenting nothing remarkable. *Mandibles* strong, and furnished with a palp which is but little enlarged, and resembling that of the Palemons rather than that of the *Penæi.* External *jaw-feet* slender, elongated, and provided with a palp which is nearly rudimentary. Three first pairs of feet didactylous, and progressively increasing in length; third pair much stouter than the others, and very spiny. Two last pairs of feet very long also, but filiform, and with their two last joints divided into a multitude of small rings: a disposition which is not seen either in the *Penæi* or the *Sicyoniæ*, and which recals the structure observable in the second pair of feet of the species of *Hippolyte*, &c. The feet bear no lamellar appendage as in the *Penæi.* The *abdomen* is of moderate size, and presents nothing remarkable. (M. E.)

Example, *Stenopus hispidus; Palemon hispidus*, Oliv.

Description.—Carapace and abdomen covered with small prickles and some hairs; rostrum pointed, slender, raised, and not reaching beyond the basilary joint of the superior antennæ. Filaments of the antennæ very long. First pair of feet shorter than the second pair, but reaching much beyond the lamellar appendage of the inferior antennæ, and smooth like the second pair. Third pair longer than the whole body, furnished with many longitudinal rows of pointed teeth. Tarsus of the two last pairs of feet bifid. Median blade of the caudal fin furrowed in the middle, and furnished above with two rows of spines. Length about two inches and a half.

Locality.—The Indian Ocean.

Sicyonia. (Edwards.)

Generic Character.—*Tegument* harder than in the greater part of the shrimps. *Body* slightly compressed. *Carapace* surmounted with a median crest, which is continued forward into a rather large *rostrum.* On each side of the carapace, about its anterior third, a spine directed forwards. *Eyes* large, cylindrical, and exposed. Upper antennæ very short, their peduncle very stout, and not presenting, as in the *Penæi*, a lamellar appendage recurved above the eyes; their terminal filaments, two in number, extremely short. External antennæ inserted below the preceding, and offering nothing particular. Two first pairs of *jaw-feet* formed nearly the same as in the *Penæi*, excepting that they are deprived of palps. Three first pairs of feet terminated by a small didactylous hand, and elongated from before backwards, as in the preceding genus; the two last pairs monodactylous, and the last much longer than the penultimate pair. None of these organs are multi-articulate, as in the *Stenopi*, nor provided with a flabelliform appendage, or a palp, as in the *Penæi.* *Abdomen* carinated above, and presenting several furrows, which make it appear as if it were sculptured; it carries below five pairs of false feet, each of which is only provided with a single natatory blade; the median blade of the caudal fin is pointed and furrowed above. *Branchiæ* eleven on each side.

Example, *Sicyonia sculpta; Cancer carinatus*, Oliv.

Description.—Rostrum of the length of the peduncle of the superior antennæ; six large teeth situated both on its superior border and the dorsal crest of the carapace; a single dentilation below, near the point of the rostrum; terminal filament of the lower antennæ slender and cylindrical; external jaw-feet moderate. Length about two inches.

Locality.—The Mediterranean.

Penæus. (Latr.)

Generic Character.—*Carapace* furnished above with a more or less long median crest, which is continued forwards into a nearly straight, lamellar, and dentilated rostrum; on each side, near the insertion of the superior antennæ, a stout tooth, and a curved longitudinal furrow, which circumscribes laterally the stomachal region; a spine nearly always exists at the point of junction of the stomachal furrow and that of the branchial region, and sometimes a small crest is seen between the first of these furrows and the basilary crest of the rostrum. Eyes stout and rounded. First joint of the *superior antennæ* very large, and excavated above so as to form a cavity in which the eyes are lodged; its external border armed with a tooth, and its internal border with a small lamellar and ciliated appendage, which curves back upwards and outwards. The two last joints of the peduncle cylindrical and very short; and the terminal filaments of varying length. The *external antennæ* present nothing remarkable. *Mandibles* provided with a very large lamellar palp. Two last pairs of jaw-feet carrying a very long and multi-articulate foliaceous palp, and provided also with a flabelliform appendage which ascends among the branchiæ; external jaw-feet long, slender, and pediform. Four first pairs of the thoracic feet provided with a flagrum which ascends into the branchial cavity as in the crawfishes, and at the base of all the feet a small lamellar appendage analagous to the palp of the jaw-feet, a mode of conformation which reminds the observer of that of the *Stomapods.* The three first pairs of feet terminated by a small didactylous hand, and augmenting progressively in length from before backwards. Two last pairs of feet monodactylous and of moderate length. *Abdomen* extremely large and very much compressed; its posterior moiety surmounted with a median crest more or less marked. False feet not encased by the lateral laminæ of the abdomen, and terminating by two ciliated laminæ of unequal size. Caudal fin large; its median blade triangular, and hollowed below by a median furrow. *Branchiæ* disposed in bundles as in the lobster, eighteen on each side, and between each bundle the flabelliform appendage of the foot situated below. (M. E.)

M. Milne Edwards subdivides the genus into the following sections:—

1. Species having the antennæ terminated by very short filaments.

* A median furrow extending from the base of the rostrum to the posterior border of the carapace.

Example, *Penæus Caramote; Cancer Kerathurus*, Forsk.; *Palemon sulcatus*, Oliv.

Description.—Rostrum shorter than the peduncle of the superior antennæ, a little recurved upwards, armed above with a dozen of rather strong teeth, and below with a single one situated a little in front of the eyes, furnished on each side with a crest which is continued backwards to the posterior border of the carapace, thus forming a very deep longitudinal furrow on each side of the median crest; a third crest, less wide, but more elevated, separates these two furrows at the posterior half of the carapace, and forms a sequence to the base of the rostrum. There is a very strong tooth on the anterior border of the carapace above the insertion of the antennæ, a second much smaller between that and the rostrum, and a third behind the lateral furrow situate at the base of the first. Eyes extremely large and very short. Terminal filaments of the superior antennæ extremely small, shorter than the two last joints of the peduncle. Base of the three first pairs of feet armed with strong spines. Median blade of the caudal fin armed at its extremity with three spines, of which the median is the strongest. Length about seven inches.

Locality.—The Mediterranean.

** No median furrow between the base of the rostrum and the posterior border of the carapace.

Example, *Penæus setiferus; Palemon setiferus*, Oliv.; *Astacus fluviatilis Americanus*, Seba.

Description.—Rostrum of the same length as the blade of the external antennæ, straight, styliform at the end, armed with two spines below, and from nine to ten teeth above, continuing backwards with a delicate crest, which occupies the posterior half of the carapace, and furnished on its sides with a small crest, which is not prolonged beyond the stomachal region. No small tooth above the base of the eyes, which are very large, and carried on rather long peduncles. Lamellar filaments of the superior antennæ about half the length of the peduncle which carries them. Multi-articulate filament of the external antennæ excessively long. No spines at the extremity of the median blade of the caudal fin. Length about seven inches.

Locality.—Very abundant at the mouths of the rivers of Florida.

2. Species having the superior antennæ terminated by filaments longer than the carapace.

Example, *Penæus membranaceus.*

Description.—Carapace slightly carinated throughout its length; rostrum a little elevated, lamellar, very short (not reaching beyond the eyes), armed above with five or six rather large teeth, and ciliated below. Eyes large and short. Terminal filaments of the superior antennæ much longer than the carapace; one slender and cylindrical, the other stout, flattened, and ciliated within. External antennæ moderate. Feet short; the third pair hardly reaching beyond the peduncle of the superior antennæ. Median blade of the caudal fin elongated, and armed with a pair of lateral spines near its point. Length about three inches.

Locality.—The Mediterranean.

M. Milne Edwards remarks that the genus *Melicertus* of Rafinesque seems to differ but little from *Penæus.*

Euphema. (Edwārds.)

Generic Character.—General form of the body approaching closely to that of *Hippolyte. Carapace* terminating anteriorly by a very long rostrum; abdomen bent towards the middle, its second ring prolonged posteriorly into a long spine, which is directed horizontally backwards, as is the rostrum forwards. *Eyes* large and short. Disposition of the *antennæ* presenting nothing remarkable; the first pair have, as usual, their first joint excavated above for the lodgment of the eyes, and terminate by two multi-articulate filaments. The second pair of antennæ are inserted below the preceding. *Mandibles* short, stout, but slightly dentilated, and provided with a palpiform, short, wide, and bi-articulate stem. The valvular appendage of the jaws of the second pair is oval, and only a little prolonged backwards. The two last pairs of jaw-feet are moderate, pediform, and provided with a lamellar palp nearly as long as the internal stem; they also carry at their base an appendage which represents the flagrum, but which is membranous and vesicular, nearly as in the *Amphipods.* The three first pairs of thoracic *feet* are terminated by a small imperfectly didactylous hand; and the two last pairs are monodactylous and strongly ciliated, so as to be rather natatory than ambulatory; all carry at their base a small very short flagrum, as well as a lamellar palp. The appendages of the five first rings of the abdomen are composed of a cylindrical peduncle and of two terminal joints, as in the ordinary Salicoques, only the blades are not ciliated. The caudal fin presents nothing remarkable. *Branchiæ* lamellar, and fixed in many rows on each side of the thorax. (M. E.)

Example, *Euphema armata;* the only known species.

Description.—Rostrum of the length of the carapace, horizontal, armed with a tooth at its base, and slightly denticulated along its superior border; a small spine on each side on the anterior border of the carapace. Internal antennæ shorter than the rostrum. First pair of feet the shortest. Dorsal spine of the second abdominal ring long and sharp, passing beyond the succeeding ring; a very small spine on the middle of the posterior border of each of the succeeding segments. Median blade of the caudal fin narrow, pointed, and terminated by two small spines; lateral blades narrow and ciliated. Length about eight lines.

Locality.—The Southern Atlantic.

Ephyra. (Roux.)

Generic Character.—Body laterally compressed; *carapace* smooth; *abdomen* carinated, and rostrum dentated; *jaw-feet* very much elongated, and the thoracic feet carrying at their base a palpiform appendage, but not appearing to have a point as in the next genus. Two first pairs of feet small, shorter than the succeeding ones, and didactylous; *carpi* simple. (Roux.)

Example, *Ephyra pelagica.*

Description.—Body arched, compressed, of a lively red-coral colour; the corselet elongated, ornamented on its sides with a curved suture, with four points and a carinated rostrum, quinquedentate above, bidentated and ciliated below. Eyes large, blackish blue; interior antennæ long, placed on a tri-articulated pedicle, the lateral pieces striated, with a spur; the jaw-feet triangular; the two first pairs of feet short, delicate, the others rather larger; the abdomen with six compressed segments, terminated by caudal, oval, oblong, ciliated scales; middle plate short, solid, convex, and pointed.

Locality.—The Mediterranean, at great depths.

Oplophorus. (Edwards.)

Generic Character.—Body not compressed. *Carapace* terminated by a styliform rostrum, which is very long and dentilated on its two borders. Peduncle of the *superior antennæ* very short, and one of the terminal filaments very stout and pyriform at its base, but soon becoming slender and cylindrical like the other. The lamellar appendage of the *external antennæ* differs much from that of all the other shrimps; it is large, narrows gradually from its base, terminates in a very sharp point, and presents a series of spines on its external edge. External *jaw-feet* short, and carrying externally an extremely large lamellar palp. Two first pairs of feet very short, terminated by a very small hand, and provided at their base with a very large and ciliated lamellar appendage. Three succeeding pairs of feet moderate and monodactylous; the appendix fixed at their base small; and the tarsus of the third and fourth pairs styliform and very large, whilst that of the posterior feet is rounded and extremely short. There is also at the base of each foot a small flabelliform appendage which ascends among the branchiæ, and the number of these last organs is nine. *Abdomen* differing but little from that of *Hippolyte.*

Example, *Oplophorus Typus.*

Description.—Rostrum of the length of the lamellar appendage of the external antennæ, slender, elevated, and furnished with seven or eight small teeth on each of its borders. A median crest extending from the base of the rostrum to the posterior border of the carapace, and two small crests on the stomachal region; two spines on each side on the anterior border of the carapace, and one at its posterior angle. A very strong pointed tooth directed backwards, springing from the upper surface of the three abdominal rings which precede the penultimate one. Median blade of the caudal fin pointed and much longer than the lateral blades. Length about 20 lines.

Locality.—New Guinea.

Pasiphæa (Savign. *Alpheus*, Risso).

Generic Character.—Body remarkably flat laterally. *Rostrum* very short or even rudimentary, and the carapace much narrower forward than behind. *Eyes* moderate and directed forward. Peduncle of the internal *antennæ* slender and terminated by two multi-articulate filaments, one of which is rather long; external antennæ inserted below the preceding, and offering nothing remarkable. Mandibles strongly dentated, and deprived of a palpiform stem. External *jaw-feet* very long, slender, and pediform; at their base a lamellar and ciliated palp as in the *Penæi.* The thoracic *feet* carry also, suspended at the external side of their basilary joint, a rather long lamellar appendage of the same form, but membranous and but little or not at all ciliated. Two first pairs of feet rather stout, nearly of the same length, armed with spines on their third joint, and terminated by a didactylous hand, the pincers of which are slender and furnished with a series of sharp spines on the prehensile border. The three next pairs of feet are very slender, monodactylous, and more or less natatory; in general, if not always, the penultimate pair are much the shortest. *Abdomen* very long and very much compressed. False feet of the first ring terminating by a single blade, but those of the four next feet carrying each two short natatory and but little ciliated blades. The sixth abdominal ring very long, and the seventh short and triangular. External blades of the caudal fin large and narrowed towards the end.

Example, *Pasiphæa Sivado.*

Description.—Distinguished from the other species by a caudal fin whose blades are equal, and the conformation of the rostrum, which is sharp, slightly curved, and inflected towards the point.

Locality.—The coasts of Nice.

Sergestes. (Edwards.)

Generic Character.—*Body* slender and a little flattened; *carapace* presenting anteriorly a small spine in lieu of a rostrum. *Eyes* very much projecting, and the ophthalmic ring on which their peduncles are inserted not completely covered by the carapace. *Upper antennæ* extremely long, and carrying, besides the principal terminal filament, two rudimentary filaments. *External antennæ* inserted below the preceding, and also very long. *Second pair of jaw-feet* nearly pediform and without either palp or flabelliform appendage, long, slender, bent back on themselves, and applied upon the mouth. Appendages which correspond to the *external jaw-feet* offering nothing which can distinguish them from the ordinary thoracic feet; they are delicate, very long, ciliated, and terminated by a very slender styliform joint. Four next pairs of feet with the same general form, slender, filiform, furnished with much hair, and presenting at their base neither flabelliform appendage nor vestige of palp; second and third pairs provided at their extremity with a rudimentary joint, which is nevertheless moveable and disposed so as to constitute a microscopic claw. Penultimate pair of feet very short and a little distant from each other; the last pair nearly rudimentary. *Abdomen* presenting nothing remarkable, except that its lateral laminæ do not descend so as to encase the base of the false feet as in the ordinary *Salicoques*. The first pair of these false feet terminates by a single natatory foliaceous blade, and presents in the male a corneous prolongation of an odd form, which is fixed to the peduncle of those appendages, and goes to articulate itself on the median line with that of the opposite side. The four next false feet have two narrow natatory blades, which are ciliated and of unequal size. The median blade of the caudal fin is small and pointed, and the lateral blades are narrow, very nearly oval, and terminated in a point. *Branchiæ* disposed on a single line, seven on each side of the thorax.

Example, *Sergestes Atlanticus*, the only known species.

Description.—Third joint of the peduncle of the upper antennæ at least as long as the preceding. Anterior feet much shorter than the external jaw-feet, which are nearly of the same length as the second and third pairs of feet. Length about an inch.

Locality.—The Atlantic Ocean, at some distance from the Azores.

Acetes. (Edwards.)

Generic Character.—Analogous to *Sergestes* in its conformation, but placed at a distance from all the animals of the same order by the absence of the two last pairs of feet. Thoracic feet, consequently, only three pairs; but, as in the Sergestes, the external jaw-feet acquire an excessive length, and perform the same functions as the ordinary feet. *Carapace* smooth, and presenting at its anterior extremity a longitudinal series of three small teeth, but there is no true rostrum. *Eyes* spherical and carried on rather long peduncles; the superior antennæ, placed above the external ones, have a long peduncle; but its last joint is shorter than the first, and only carries two bristles, one of which is about twice the length of the body. The lower or external antennæ present a terminal filament not less elongated, and their base is covered, as in ordinary, by a great corneous plate. The mandibles, or jaws, properly so called, and the two pairs of jaw-feet, do not differ remarkably from those of *Sergestes*; and the same may be said of the ambulatory feet, which are filiform and terminated by a very elongated joint, but the two posterior feet are wanting, as has been observed. Nevertheless a thoracic segment may still be distinguished behind, carrying branchiæ like the preceding, but without locomotive appendages. The abdomen presents nothing remarkable; the natatory false feet all terminate by two narrow and pointed blades, which are at first nearly of the same length, but the internal one of which becomes shorter on the last segments. The peduncle of these appendages presents very opposite modifications; for upon the first rings of the abdomen it is long and narrow, whilst upon the last it is stout and short. The caudal fin resembles that of *Sergestes.*

Example, *Acetes Indicus.*

Description.—Body compressed laterally; rostral crest armed with three or four dentilations. Posterior feet longer than those of the two preceding pairs, but a little shorter than the external jaw-feet. Lower antennæ about four times as long as the body. Length about one inch.

Such is a mere outline of this very numerous and extensive family, which is spread more widely over the globe than perhaps any other of the crustaceous forms. The part assigned to the *Salicoques* in the sea, and there is hardly any sea without some species of the race, seems to be that analogous to some of the insects on land, whose task it is to clear away the remains of dead animal matter after the beasts and birds of prey have been satiated. If a dead small bird or frog be placed where ants can have access to it, those insects will speedily reduce the body to a closely-cleaned skeleton. The shrimp family, acting in hosts, as speedily remove all traces of fish or flesh from the bones of any dead animal exposed to their ravages. They are in short the principal scavengers of the ocean; and, notwithstanding their office, they are deservedly and highly prized as nutritious and delicious food.

The *Opossum Shrimps* will be treated of under the article STOMAPODES.

FOSSIL SHRIMPS.

Crangon.

M. Milne Edwards observes that the *Crangon Magnevilii* of M. Delonchamps is a fossil crustacean which, as yet, is only imperfectly known; but which, from the conformation of its feet, would seem to belong to the genus *Crangon*, or at least to differ but little from it. This fossil was found at Vaucelles, in the Jurassic limestone of Caen, and is remarkable for the size of the second pair of feet, which are longer than all the succeeding ones.

Another fossil, found in the coral limestone of Ranville, and considered by M. Delonchamps to belong to the same species as the preceding, seems to M. Milne Edwards to be worthy of being distinguished from it by reason of the subcheliform hand and some other important characters.

Alpheus ?

M. Milne Edwards is inclined to believe that the fossil crustacean figured by Schlotheim under the name of *Macrourites modestiformis*, is a shrimp belonging to the tribe of Alpheans, or at least intermediate between them and the Crangonians. It seems to approach the last by its rude and unequal carapace, and by the conformation of the abdomen; but, as in the Alpheans, the first or second pair of feet are very large, of unequal size, and terminated by a well-formed didactylous claw.

Palemon ?

The fossil crustacean figured by M. Desmarest under the name of *Palemon Spinipes*, appears to M. Milne Edwards to constitute the type of a particular genus intermediate between *Palemon*, *Pandalus*, and *Sergestes*; the body of this shrimp is compressed laterally, and the abdomen seems to be slightly carinated as in the *Penæi*; the carapace terminates forward by a large, straight, compressed, and cultriform rostrum. The superior antennæ are provided with very long multi-articulate filaments, as in Palemon. The second or third last pairs of feet are slender and monodactylous, whilst the two first pairs are stout and appear to be didactylous. The members which M. Milne Edwards thinks are the external jaw-feet present very considerable dimensions, and are converted into organs of locomotion as in *Sergestes*; and the four anterior feet are furnished on their interior border with long spiniform hairs and are terminated by a flattened joint.

Locality.—Lithographic slate of Solenhofen and Pappenheim.

The same zoologist remarks that the *Macrourites tipularius* of Schlotheim is a shrimp which closely approaches the preceding, but is, still, very distinct from it. It appears to M. Milne Edwards that it ought to be arranged in the same genus, and it presents in a still more marked degree the character so remarkable in the preceding fossil, consisting of the presence of a pair of very large and monodactylous ambulatory feet before the didactylous feet, which last are of moderate length and consist of two pairs. M. Milne

Edwards observes that in the figure given by Schlotheim they only appear to be succeeded by two pairs of monodactylous feet; but in a specimen belonging to the Paris Museum one may see that there are three pairs: these six posterior feet are very slender and long. The general form of the body is nearly the same as in the preceding species, but the rostrum is much shorter, and a lamellar appendage situated above the base of the external antennæ may be clearly distinguished; the internal antennæ do not appear to be terminated by more than two filaments. The anterior limbs, which M. Milne Edwards considers as analogous to the external jaw-feet of *Sergestes*, are so large that their antepenultimate joint reaches far beyond the extremity of the rostrum, as well as the peduncle of the antennæ.

Sicyonia?

The fossil crustacean figured by Schlotheim under the name of *Macrourites fusiformis* appears to M. Milne Edwards to be intermediate between *Sicyonia*, *Palemon*, and *Hippolyte*, but he thinks that its place ought to be in the tribe of *Peneans*. The carapace is very short, and surmounted by a median dentilated crest which occupies its whole length, and terminates anteriorly by a small rostrum which is inflected and dentilated above. The abdomen seems to be equally carinated above, and the three first pairs of feet are didactylous; but the first and third pairs are slender, whilst the second pair are very stout, although they are of moderate length. M. Milne Edwards thinks that it ought to form the type of a distinct genus.

We have seen [article Homarus] that M. Milne Edwards is of opinion that the genus *Coleia* of Broderip (*Geol. Trans.*, 2nd series, vol. v., pl. 12) is intermediate between the *Astacians* and *Salicoques* or Shrimps. In the same paper Mr. Broderip has described and figured the remains of other macrourous decapods found with *Coleia* at Lyme Regis, but of smaller size. Their chelæ and legs had been washed away, and the carapace was very obscure. In two of the specimens however may be seen the breathing organs after an inhumation of thousands of years. The tips of the four larger branchiæ and of the four smaller ones below may be observed pointing towards the situation of the heart, and these branchiæ show that the last-named crustaceans did not belong to the *Amphipoda*, but to the highest division of the *Macroura*. The spines, he remarks, are like those of *Crangon salebrosus;* and he states that the general organization, so far as it is presented to view, reminds the observer of the Arctic forms of the Macrourous crustaceans; adding that there is enough to satisfy himself and to convince his friend Professor Owen, whose attention to this branch of natural history makes his opinion of great value, that these last-mentioned fossils belong to the *Salicoques*, or Shrimp-family.

SHROPSHIRE, a county on the west side of England, lying between 52° 20′ and 53° 4′ N. lat. and 2° 17′ and 3° 14′ W. long. It derives its name from the Saxon *Scrobscire*, a contraction of Scrobbes-burh-scyre, or the shire of *Scrobbes-burh*, the Saxon name for Shrewsbury. The term Salop, in Latin Salopia, appears to owe its origin to *Sloppesburie*, a Norman corruption of the Saxon name. [Shrewsbury.]

It is bounded on the north by Cheshire and a detached part of Flintshire; on the east by Staffordshire; on the south-east, south, and south-west by the counties of Worcester, Hereford, and Radnor; and on the west and north-west by Montgomeryshire and Denbighshire. The general figure of the county is a parallelogram, but its boundary-line is extremely irregular. Its greatest length from north to south is 46 miles, and its greatest breadth 37 miles, and the circumference is upwards of two hundred miles. The Hales-Owen division of the hundred of Brimstrey is a detached portion of the county, of considerable extent, and situated within the counties of Stafford and Worcester. The area of the county is 1343 square miles, or 859,520 acres, but according to the Population Returns made in 1831, the number of acres assigned to the several parishes amounts to 864,360. The gross population in 1831 was 222,938, and the average number of inhabitants to each square mile 165. In size Shropshire is exceeded by fourteen English counties; it is however the largest but one of the inland counties; Wiltshire having a surface of 1367 square miles. In regard to absolute population, it is exceeded by twenty-two English counties. Its relative amount of population to neighbouring counties may be seen from the following estimate. The average number of persons, in 1831, to a square mile in Staffordshire was 346, Cheshire 318, Worcestershire 292, Shropshire 165, Denbighshire 132, Herefordshire 122, Montgomeryshire 79, and Radnor 58. Shrewsbury, the county town, is distant 154 miles N.W. from London.

Surface, Hydrography, and Communications.—Shropshire contains every variety of surface, from the rugged mountain to the fertile and cultivated valley. The river Severn separates the county into two nearly equal divisions, and forms a boundary between the more elevated districts of the west and south, and an extensive level on the north and north-east, which extends into Cheshire and Staffordshire. On the west, various chains of Welsh mountains extend into Shropshire. The Berwyn range, which traverses Montgomeryshire, terminates within the boundaries of Shropshire, between Oswestry and Chirk, with Selattyn Hill, which is 1300 feet above the level of the sea. The Breidden Hills, remarkable for their picturesque forms, are situated on the southern bank of the Severn, near where that river enters Shropshire. The greater portion and highest parts of these hills lie in Montgomeryshire, but their north-eastern extremities extend four miles into this county, forming the hills of Middleton, Cefn-y-castel, Bulthey, and Banseley. A long series of elevations, commencing in Radnorshire, extend into Shropshire on the south-west, and form the district of mountainous land called Clun Forest, portions of which attain an elevation of 1200 feet and upwards. Connected with this range by intermediate hills is an elevated tract situated north of Bishop's Castle and surrounding the village of Shelve, the central ridge of which runs from south-west to north-east, and is about seven miles long. The highest point of it is Corndon Mountain, 1700 feet. On the west this tract is separated by a valley from the Long Mountain in Montgomeryshire, and on the east it is flanked by a very singular mass of rocks called the Stiperstones. Proceeding to the south-east, another range of hills is approached, the most considerable portion of which is called the Longmynd. This range is connected on the south with that mountainous district lying east of Clun Forest, which occupies the tracts between the valleys of the Teme, the Clun, and the Onny. North of the Onny, the Longmynd comprises the Warren Hill, 1200 feet; Medlicot, 1680 feet; Stillhill, 900 feet, &c. On the east lies the valley of Church Stretton, which is bounded on the opposite side by the Caradoc Hills, comprising the heights of Ragleath (1000 feet), Hope Bowdler, Caradoc (1200 feet), the Lawley (900 feet), Frodesley, and Acton Burnel. This range, like those just described, runs from south-west to north-east. It extends across the Severn in tracts of inferior elevation, and terminates near Wellington, in the remarkable and well-known hill called the Wrekin. This hill rises 1320 feet above the sea, and being considerably higher than and nearly detached from all neighbouring hills, it forms a conspicuous object. The long narrow valley of Ape-dale lies to the east of the Caradoc Hills, and this is succeeded by a singular elevated ridge, known by the name of Wenlock Edge. This ridge extends from the valley of the Onny to the Severn at Coalbrook-dale, a distance of about 20 miles. It rises at a slight angle from the east and south-east, to the height of from 500 to 600 feet, and presents a steep escarpment on the west. This ridge may be traced south of the Onny into Herefordshire near Leintwardine, forming the hills called Yeo-edge and Shelderton, which are respectively 850 and 900 feet high. Wenlock-edge is flanked on the east by a number of detached rounded hills, extending from the Onny to the town of Wenlock, all of which are under 1000 feet in height, and, as well as the greater portion of Wenlock-edge, are under cultivation or planted to their summits. Between the hills last described and the town of Ludlow there lies a rich tract of low land called Corvedale. This valley extends north to within a short distance of Wenlock, and on the south opens to the valley of the Teme. It is shut in on the east by a range of hills rising four or five hundred feet above the valley, and extending from Ludlow northwards on the west side of the Brown Clee Hills, which attain the greatest elevation in the county, and consist of two hills called Abdon Barf and Clee Barf, the former of which is 1806 feet above the sea, and the latter 1600 feet. A few miles south of the Brown Clee hills, and connected with them by a tract of sandstone of some (although considerably inferior) elevation, lie the Titterstone Clee Hills, the summit of which also attains the height of 1730 feet, and presents an extremely picturesque appearance in the scenery of this and adjoining counties. The part of Shropshire lying east and south-east of the Titterstone Clee Hills consists of elevations from 400 to 800 feet high, and intersected by numerous valleys. North and north-west of the Clee Hills an open and fertile country extends as far as the Severn.

The part of Shropshire lying on the left bank of that river, as was before stated, does not present such a varied surface as that just described, and a greater proportion of it is under cultivation. The tract which lies on the northern boundary of the county, and which divides it from Cheshire, is not more than 300 feet above the sea. This is the watershed or limit of the drainage of the Severn, the waters on the north falling towards the rivers Dee and Weaver.

Although Shropshire may be considered a well-cultivated county, yet there are extensive tracts of waste land, many portions of which might be enclosed with advantage. Some of the elevated districts which have been mentioned, such as the Corndon, Stiperstones, Caradoc Hills, the Brown and Titterstone Clee Hills, &c., are however too barren or rugged to admit of cultivation, but they afford herbage for sheep. Clun Forest is not, as its name would imply, a wooded tract, but consists of smooth rounded hills, which were used until lately as sheepwalks, and comprise upwards of 12,000 acres; the greater portion of it is now divided and allotted by act of parliament. The Morf, situated on the left bank of the Severn below Bridgnorth, is a tract of waste land, five miles in length and from two to three in breadth. This, as well as portions of the Longmynd and various other commons, might, it is said, be profitably enclosed, or at least planted. The cultivation of mountain land is however on the increase. In the parish of Selattyn, in the neighbourhood of Oswestry, the population has increased considerably within the last few years, and it is attributed to this cause. There are numerous wastes between Shrewsbury and Drayton, and the county also contains several extensive mosses or bogs, such as Bagley Moors between Shrewsbury and Ellesmere, which, previously to any attempt at cultivation, would require an efficient system of draining, the expense of which, where practicable, would be more than compensated for by the improved quality of the soil.

The forest of Wyre lies on the right bank of the Severn, between the towns of Bewdley and Cleobury Mortimer. It is a large tract, principally of underwood, which is cut down when young for the purpose of burning into charcoal to supply the iron-works in the vicinity. Shropshire contains a greater quantity of oak timber than almost any county in England.

The principal river of Shropshire is the Severn. The other rivers and streams are the Teme, Clun, Onny, Tern, Roden, Perry, Meole, Cound, Warf, Rea, and Corve.

The Severn enters the county on the west from Montgomeryshire, a short distance below its junction with the Vyrnwy, a Montgomeryshire stream. Its general direction as far as Shrewsbury is easterly, but previously to reaching that town it makes a considerable bend to the north. From Shrewsbury it pursues a winding course, but having a main inclination to the south-east as far as Coalbrook-dale. Its subsequent course is more decidedly south, passing by Bridgnorth, and quitting Shropshire and entering Worcestershire a short distance above Bewdley. Its entire course through the county is near seventy miles, in no part of which does it serve as a boundary-line, but, as before mentioned, flows through the middle of the county. It is navigable to within a short distance of Welshpool in Montgomeryshire, and consequently is of considerable importance as one of the chief means of transporting the productions and manufactures of the county. [SEVERN.]

The Teme has neither its rise, termination, nor the principal part of its course within Shropshire, yet, being the river next in size to the Severn, and connected with the drainage of the southern portion of the county, it claims notice immediately after the Severn. It rises in Radnorshire, and soon forms the boundary between that county and Shropshire. A short distance below the town of Knighton, in the former county, it becomes the boundary between the counties of Hereford and Salop, and subsequently enters the latter a short distance above the town of Ludlow, running under the walls of that castle: it then alternately divides this county from those of Worcester and Hereford, and finally quits it and enters Worcestershire below the town of Tenbury, and falls into the Severn near Worcester. Throughout its whole course it flows through rich and picturesque scenery. Its direction is nearly east, deflecting below Ludlow to the south-east.

The Clun is a tributary of the last-mentioned river, and rises within the county in the wild uncultivated district called Clun Forest, and flows east. At Clun it is joined by a brook from the left bank, and at Clunbury by another stream from the same side. Its course is then to the south, and it falls into the Teme at the village of Leintwardine in Herefordshire.

The Onny is also a tributary of the Teme. It rises among the Corndon Hills, and takes a south-easterly direction. It is joined from the north by Eaton brook, which flows through Ape-dale, and by several small streams, and unites with the Teme about two miles above Ludlow. Its whole course is within the limits of the county, and it falls about 300 feet.

The Tern rises in a small pool on the borders of Staffordshire, in the north-eastern district of Shropshire, and flows south-west by Market-Drayton. It then takes a more directly southerly course, and is joined on the left bank by the river Mees, which runs near the town of Newport. It is also joined by other streams from the same side, and again running westward is joined by the river Roden on the right, and falls into the Severn between Atcham and Wroxeter. Its whole course is about 30 miles, and it is the longest of the Shropshire streams.

The Roden rises between Ellesmere and Whitchurch, and takes a south-easterly direction by Wem, and, as before stated, falls into the Tern.

The Perry is a tributary of the Severn, and rises among the Selattyn Hills north of Oswestry. Its course is south-west, and it falls into the Severn on the north bank of that river, a short distance below Montford bridge, and about eight miles above Shrewsbury.

The Meole brook rises from the eastern flank of the Longmynd, and flows east-north-east. It is joined from the right by the Rea brook, which rises in Marton Pool, and passing by the village of Meole brace joins the Severn at Shrewsbury.

The Cound is also a tributary of the Severn from the south side. It rises in the neighbourhood of Smethcote, and flowing north by Longnor and Condover, unites with the Severn about two miles below Wroxeter.

The Warf is another tributary of the Severn. It rises in the neighbourhood of Shiffnal, and pursuing a southerly direction enters the Severn near Bridgnorth.

There are two or three streams in the county bearing the name of Rea, but the principal of them takes its rise in the parish of Ditton Priors, in the liberties of Wenlock, and running south by Cleobury Mortimer, unites with the Teme at Newnham below Tenbury in Worcestershire. The Corve also takes its rise within the liberties of Wenlock, and flows south-west through the fertile valley known as Corve-dale. It joins the Teme at Ludlow.

It will be seen that the prevailing tendency of the rivers is to the south and south-east; the only streams among those we have mentioned which deviate from that course being the Meole and the Cound. To these two must be added the drainage of the extreme northern portion of the county, whose waters flow north to the river Dee at Weaver. The Severn is the only navigable river.

The fish that frequent that part of the Severn which is in Shropshire are salmon, trout, grayling, pike, perch, shad, chub, gudgeon, roach, dace, carp, flounders, eels, and a few lampreys. The fish of the other rivers and streams are principally trout and grayling.

The lakes, or natural pools of water, are not numerous or extensive. The largest is Ellesmere, near the town of that name. It covers about 116 acres. The smaller are Whitemere, Colemere, Avesmere, and Mereton pools.

Canals.—The first canal formed in this county appears to have been a short line commencing at Donnington Wood, in the parish of Lilleshall, and terminating at Pave Lane near Newport, a distance of about seven miles, with a short branch to lime-works at Lilleshall. This canal was formed by the Marquis of Stafford, for the purpose of conveying coal from Donnington to the lime-works at Lilleshall, and for public sale at the wharf at Pave Lane.

In 1788 the Shropshire canal was projected from the termination of the last-mentioned canal at Donnington Wood to the Severn, at Coalport below Coalbrook-dale, and was completed in 1792. The length of it is about seven and a half miles, with a rise of 120 feet and a fall of 333 feet. This canal is of the greatest importance in conveying the produce of the coal, iron, and other works to the Severn. There is a branch from this canal at Southall-bank to Brierly-hill near Coalbrook-dale, a distance of 2¾ miles, for the same purposes, as well as for bringing up limestone for the use of the iron-works. This canal is supplied with water by means of engines which drain the mines in the neighbourhood, and also by reservoirs. A short canal from the Oaken-gates to the iron-works at Ketley had been previously constructed by Mr. William Reynolds of Ketley.

The Shrewsbury canal was commenced in 1793, under the superintendence of the late Mr. Telford. It begins at the Severn at Shrewsbury, and after running on the left bank of that river for some distance, turns north-east and joins the Donnington and Shropshire canals at Wrockwardine-wood. It was upon the line of this canal that Mr. Telford constructed the first aqueduct of cast-iron. It crosses the valley of the Teme at Long Mill, and is 186 feet in length. It was proposed in consequence of the great floods which happened in 1795, and was completed in March, 1796. The length of the Shrewsbury canal is 17 miles; it has a rise of 154 feet and a fall of 22 feet. There is a peculiarity in the construction of the Shrewsbury as well as in the Ketley and Shropshire canals, which consists in the application of inclined planes instead of locks for the ascent and descent of boats. The inclined plane was first introduced by Mr. William Reynolds on the Ketley canal; the ground over which this canal was formed, being high, rugged, and separated from the adjoining country, rendered it impossible to procure a sufficient quantity of water for the construction of locks. The boats are placed on frames which slide up and down the inclined plane on iron rails, and as one boat descends another ascends. The inclined plane in the Ketley canal has a fall of 73 feet. On the Shropshire canal there are three inclined planes: the first 320 yards in length, and with a rise of 120 feet; the second is 600 yards long, with a fall of 126 feet; and the third 350 yards, with a fall of 207 feet. There is an inclined plane on the Shrewsbury canal, 223 yards in length, with 75 feet rise.

The Birmingham and Liverpool Junction Canal, commenced in 1826, passes through the north-eastern part of the county, and a communication between this canal and the Shrewsbury has been effected by means of a canal which branches off from the Shrewsbury line near Eyton, and passing by Newport unites with the Birmingham and Liverpool canal about four miles from that town.

The Chester and Ellesmere canal traverses the northern part of the county. The branch of it known as the Montgomeryshire canal also passes through a portion of the county. It was intended to form another line from Hordley on the Montgomeryshire canal to Shrewsbury, but it has not been carried farther than Weston wharf.

The canals of Shropshire are confined to that portion of the county which lies north of the Severn. The southern part is wholly devoid of water communication.

Roads.—The roads of this county, both turnpike and private, were described at the end of the last century as generally bad. 'The private ones, particularly in the clay part of the county, being almost impassable to any but the inhabitants, notwithstanding many acts of parliament had been passed with a view to make them perfectly good.' In common with those of all other counties, a great improvement has taken place since that time in the roads of Shropshire. The average number of miles of paved streets and turnpike roads in the years 1812-13-14 was 713; and of other highways 2252; and in 1839 the number of miles of turnpike roads was 754, and of other highways 1876.

The principal mail and coach road in the county is the London and Holyhead road, which enters Shropshire between Wolverhampton and Shiffnal, passes through Shrewsbury, and enters Denbighshire near Chirk. The improvements on this road were commenced in 1815, by Mr. Telford, under a government commission. The whole line of this road is now vested in the commissioners of woods and works, and other commissioners; and parliament has from time to time granted large sums of money for improvements. In 1836 the sum of 4000*l.* was granted for improving the portion of this road lying between Shrewsbury and Oswestry, by lowering Mountford Hill between Shrewsbury and the ten-mile stone on the road to Oswestry. The ordinary width of this road, exclusive of foot-paths, is 30 feet. It was the chief line of communication between London and Dublin, but the opening of railroads from the British metropolis to Liverpool has interfered considerably with the traffic on the Holyhead road. The Bristol, Shrewsbury, and Chester road enters Shropshire at Ludlow, passes through Church Stretton to Shrewsbury, and thence northwards. It is traversed daily by the Bristol and Chester mails. There is a branch from this road leading from Ludlow to Bishop's Castle and Montgomery. There are mail-coach and other roads from Bridgnorth to Shrewsbury, Ludlow to Birmingham over the Clee Hills, Ludlow to Wenlock and Coalbrook-dale, and the road from Ludlow to Bridgnorth has been recently altered and improved. There are also various roads communicating with Coalbrook-dale, Wellington, Drayton, Newport, &c. No railroad for steam-carriages has yet been formed in the county.

Geology and Mineralogy.—In noticing the physical appearance of Shropshire, it was mentioned that the part of the county lying north and east of the Severn differed materially in its general character from the western and southern districts, the former being more even and less elevated than the latter; and it will now be seen that this marked difference is intimately connected with the geological phenomena of the county; for the river Severn nearly forms the division between the new red system on the north, and the older formations on the south; and where any exceptions to this boundary occur, there also a difference of outline and elevation may be observed.

In noticing the different strata of this county in a descending order, an outlier of lias situated between Whitchurch and Market-Drayton first claims attention. It was discovered by Mr. Murchison in 1834. It lies in an elliptical basin, the new red-sandstone rising from beneath, and forming around the lias on the south the hills of Hawkstone, and appearing on the east and south-east at Belton and Market-Drayton, on the north-east in the rising ground extending towards Nantwich, and to the north-west in the undulating country near Whitchurch. The western boundary is not well defined, owing to the low form of the ground, and the superficial accumulations of gravel, sand, and peat; but the lias must have at least a length of ten miles, and a breadth of three or four miles. The greater part of this basin consists of lower lias shale, finely laminated; but the overlying subdivision of the marlstone is also apparent at Prees. The strata contain the characteristic fossils of the lias, and have been bored through in various places for coal, but there is no probability of that fuel being obtained, the experimentalists having mistaken the black lias shale for coal shale. This outlier is distant sixty miles from the nearest point of the great lias formation in Worcestershire and Warwickshire; but Mr. Murchison, from observations he has made, thinks it probable that these formations were originally connected.

The new red system, which rises from beneath and surrounds the bed of lias, occupies the whole northern portion of the county, extending north and east into Cheshire and Staffordshire, and on the west passing into the coal-formation of Chirk and Oswestry. On the south-west it wraps round the edges of the Silurian rocks of Montgomeryshire, and extends for some miles south of the Severn to the coal-formation about Westbury and Pontesbury, where the southern edge of the new red-sandstone overlies that coal-field which extends north-east to near Shrewsbury; but the sandstone again penetrates south to a narrow point near the Caradoc Hills, and is succeeded on the west by the coal-field of Le Botwood. The edges of the rocks of the Silurian system extending north across the Severn, as well as the trap-rocks of the Wrekin, again deflect the sandstone, the boundary-line of which is extended still farther to the north-east, from Wellington to near Newport, by the coal-formation of Coalbrook-dale, on the western edge of which field the sandstone again appears, and occupies the remainder of the county lying east of the Severn, and extends a few miles west of that river in the neighbourhood of Bridgnorth, Chelmarsh, &c., and bounded by the old red-sandstone and an elongated portion of the Forest of Wyre coal-formation.

The new red system in this part of England consists of—1, *Saliferous marls*, &c.; 2, *Red-sandstone* and *quartzose conglomerate*; 3, *Calcareous conglomerate*; and, 4, *Lower red-sandstone*; the first and second being respectively the equivalents of the *keuper* and *bunter sandstein* of foreign geologists. The third division is of the same age as the dolomitic conglomerate of the south-west and of the magnesian limestone of the north-east of England; and the fourth is the equivalent of the sandstones of the north-east of England, occupying the same place as the German *rothe-todte-liegende*.

In addition to these beds, there are in some places calcareous flags lying between the red-sandstone and saliferous marls, which appear to be the representatives of the *muschelkalk*, although none of the fossils peculiar to that formation have yet been discovered in them. In the neighbourhood of the outlier of lias just mentioned the upper beds of the new red system appear, and are especially well developed at Broughton, seven miles north of Shrewsbury, where the saliferous marls pass beneath the lias, and overlie the calcareous flags or muschelkalk which rest upon the sandstones of the Hawkstone Hills. These standstones (No. 2) occupy the greater part of the new red system in Shropshire, and may be seen at Ashley Heath, in the north-east of the county, at an elevation of 803 feet; and on the south-west they occupy Harmer Hill, Pimhill, and the rocks at Ness Cliff, on the road between Shrewsbury and Oswestry. This division of the system also forms the northern and north-eastern portions of the great plain of Shrewsbury; but can only be seen at intervals, the surface being covered with gravel, clay, &c. It also extends over the country lying between the coal-fields of Coalbrook-dale and Staffordshire, and the district east of Bridgnorth. The calcareous conglomerate (No. 3) is well displayed between Cardeston and Alberbury, west of Shrewsbury and south of the Severn. It there constitutes a low ridge two miles in length, presenting its escarpment to the carboniferous tracts of Wolliston and Westbury. This formation also occurs east of the Coalbrook-dale coal-fields, running from the Severn at Coalport to near Lilleshall. It is also met with at Apley Terrace and other spots on the left bank of the Severn, in the neighbourhood of Bridgnorth, and at Chelmarsh, a few miles lower down on the opposite side of the river. The extensive denudation of the new red system between Newport and Shrewsbury appears to have obliterated all traces of these conglomerates; but they may be observed on the banks of the Meole brook, south of Shrewsbury. To ascertain the position and localities occupied by the lower red-sandstone (No. 4) in Shropshire, it is only necessary to mention, that as the new red system occurs there in the form of a basin, it follows that the lower members will appear towards the edges of that system; and accordingly the lower red-sandstone will be met with along the line previously pointed out as the boundary of the system. The town of Bridgnorth is built upon these lower beds, and a good natural section of them, passing into the coal-measures, occurs on the western slope of Chelmarsh Common. Bands of impure, concretionary, and mottled limestone occur in these beds, and bear a close resemblance to the cornstone of the old red-sandstone.

Proceeding in a descending order, the carboniferous system of Shropshire next claims attention, and the coal-field of Coalbrook-dale, being the most extensive and productive in the county, deserves the first notice. It extends from near Wenlock, on the right bank of the Severn, across that river to Wellington on the north-west, and is prolongated in a north-easterly direction to Lilleshall, while a thin tortuous zone extends south to Tasley, within a short distance of Bridgnorth. The most productive portion of this field includes Broseley on the south, and stretches north of the Severn in a large triangular-shaped mass, having Lilleshall for its apex. On the north-west and east, being more than two-thirds of its circumference, this coal-field is bounded and overlaid by the lower new red-sandstone, but the passage from one formation into the other is rendered difficult of observation or obscure by faults and accumulations of drifted matter. On the west it is flanked by a thin zone of the lower Silurian rocks, and by the trap rocks of the Wrekin and Ercall hills, and on the south by the old red-sandstone and upper Silurian rocks. In the upper measures of this coal-field there is a remarkable band of fresh-water limestone, which was quite a new feature in coal-fields, until Mr. Murchison discovered it in the coal-field of Shrewsbury. He subsequently recognised it, in 1832, in the southern edge of this coal-field, and some years afterwards it was noticed in the coal-measures of Ardwick near Manchester. At Tasley, in the Coalbrook-dale field, this limestone has a thickness of three feet; but, like the associated strata, it is not of great persistency, and thins out and reappears at intervals. Its western termination is near the Breidden Hills, where it is associated with coal, and passes upwards into the lower new red-sandstone. It has been recently discovered four yards in thickness near Broseley. Its geological position, wherever it has been observed, is immediately under the youngest members of the carboniferous series, the strata below the freshwater limestone being the great productive mining portion of the district. The characteristic fossils of this limestone in the Coalbrook-dale field are a Cypris, and a very minute univalve, which has been named *Microconchus carbonarius*. The coal and iron measures below it are generally more abundant in the northern than in the southern part of the field, and they are more persistent than the upper measures; but nevertheless great changes occur within a short distance, beds of sandstone passing into clay, and clay into sandstone, while the coal-seams wedge out, or taper away and disappear amid the shales and sandstones. In a shaft near Madeley, 230 yards in depth, twenty-one carbonaceous beds occur, of which ten are pure coal, and are reached at a depth of about 200 yards, and have a total thickness of 15 ft. 11 in.

The following table will show the variations in the number and thickness of the seams in different parts of the coal-field:—

Pits.	Thickness of Coal.			No. of Beds of Coal.
	yds.	ft.	in.	
Hadley . . .	15	0	0	16
Sneds Hill . .	14	2	2	12
Malinslee . .	11	0	10	13
Langley . .	11	2	6	11
Dawley . .	14	0	0	16
Lightmoor , .	13	2	0	17
Madeley . .	10	2	10	24
Broseley . . .	7	0	9	13

The coal-measures on the east side of the field are not less than 1000 feet thick. The ironstone of this field is both concretionary and flat-bedded, and the various courses of it are known under local names, such as *New Mine*, *Crawstone*, *Pennystone*, &c. The ores of iron are peroxides in sandstone, argillaceous carbonates in shale, and sulphurets in the coal. The sulphuret of iron is the most abundant mineral; and next to it the sulphuret of zinc, or blende. Titanium has been detected in the refuse slags of iron-ore. Petroleum occurs in great abundance in both the upper and lower measures, and some of the beds of shale of the latter afford excellent fire-clay, which is used in the manufacture of pipes and pottery.

The true millstone-grit appears to be absent in this formation; but the grits, conglomerates, and sandstones forming the lower portion of the coal-field may perhaps be considered as its representatives. The carboniferous limestone does not occur in any extensive range, and the coal-field throughout the greater part of its extent reposes upon older rocks, chiefly of the Silurian system, and, in the southern district, upon the old red-sandstone. The carboniferous limestone however is met with at Lilleshall, Little Wenlock, and Steeraway, and traces of it occur at intermediate spots.

The coal-field has been disturbed, especially its western side, by the protrusion of trap, differing in age and mineral character, but appearing on contiguous lines of fissure parallel to that of which the Wrekin is composed, and producing the various dislocations with which the field abounds. The main lines of fault run nearly from south-west to north-east, but are traversed by cross faults. Mr. Prestwich observes that there is probably no coal-field of equal size in the kingdom which has been so much shattered. The most powerful dislocation within the field is called the Lightmoor Fault, and is an upcast of more than two hundred yards at the point of its greatest amount. The trap rock juts out in bosses of irregular shape in the vicinity of Little Wenlock.

The organic remains of the coal-measures of this field are numerous. Those noticed comprise between forty and fifty species of terrestrial plants, three genera of fishes, three species of trilobites, with other crustacea, and forty species of conchifera and mollusca.

The Shrewsbury coal-field, already mentioned in describing the southern boundary of the new red system, extends from the Severn at the Breidden Hills on the west, to Shrewsbury on the east, and occupies a semicircular bay, of which Pontesbury is the southern point. The south-west and south-east sides of this field rest unconformably upon older rocks of various ages; and on the opposite side the coal-measures graduate upwards into the lower new red-sandstone; and at Wellbatch, Asterley, and Coedway the sandstone may be seen graduating into the coal-measures. The strata of the coal-field have generally a slight inclination towards a common centre. The principal places where the coal is worked are Nobold, Wellbatch, Aston, Pontesbury, Minsterly, Westbury, Braggington, and Coedway; and where the formation is best developed the coal is found in three seams, consisting, in descending order, of half-yard, yard, and two-foot coals. The last is generally the best. These coal-beds are separated from each other by red, green, and black shale, and clod. Owing to the unequal thickness of the overlying strata and numerous dislocations, the coal-seams are reached at various levels. The deepest pits are those farthest from the edge of the field, and are about ninety-five yards; while near the hilly sides of the older rocks coal is met with at from ten to twenty yards. The strata of this coal-field belong to the upper or youngest series of coal-measures, and the freshwater limestone described in the Coalbrook-dale field is found between the seams of coal, and was indeed first noticed by Mr. Murchison in this locality. It varies in thickness from three to eight feet; and at Pontesford it is divided into two beds.

There are several small irregular carbonaceous troughs lying between the Shrewsbury and Coalbrook-dale fields, but similar in character to the former, and containing the freshwater limestone. The largest of these is that of Le Botwood. Others occur at Uffington (three miles north-east of Shrewsbury), Longnor, Longden, Pitchford, Cound, Dryton, &c.; in some of which coal is worked.

The coal-field of Oswestry is situated on the western verge of the county, and is quite distinct from those already noticed. The productive portion of it is very limited, occupying a small area between the town of Oswestry and the hills of Llanvorda, Trefonen, Treflach, and Sweeny. It contains only two seams of coal worthy of extraction, the upper being four feet thick; the lower, which is six feet, is a very inferior coal. Near their outcrop these seams are separated from each other by about twelve yards of strata composed of shale and clod, with thin courses of sandstone. In these situations the coal has long since been exhausted, and it is now raised from spots towards the centre of the basin, and by shafts sunk through the new red-sandstone, under which the coal passes on the east side of the field. The millstone-grit and sandstone are developed to a large extent, rising west of the coal into broad ledges towards the higher hills of limestone; and on the other hand dipping generally at very slight angles beneath the coal.

The carboniferous limestone is better developed here than in any other part of the county. It separates the millstone-grit from the older Silurian rocks, and has a maximum thickness of at least four or five hundred feet. This coal-field is affected by numerous faults, the two principal of which run north by east and south by west, which is nearly the line of elevation of the adjacent mountains on which the coal-field reposes.

The roof of the coal abounds in impressions of plants, and the mountain limestone contains a vast profusion of characteristic corals and crinoidea, with numbers of the *Productus hemisphæricus, P. Martini*, &c.

The coal-fields of Shropshire remaining to be noticed are situated on the south side of the county. That of the Titterstone Clee Hill lies between the towns of Ludlow and Cleobury-Mortimer. This carboniferous tract lies at a very considerable height, and is of an extremely irregular outline. It is flanked on the south and north-east by zones of carboniferous limestone rising from beneath the millstone-grit, which is on the other sides bounded by the old red-sandstone, which wraps entirely around the tract, separating it on the north from the coal-field of the Brown Clee Hill, on the west from the Ludlow Rocks, and on the east from the coal-fields of the Forest of Wyre.

The portion of the field known by the name of Cornbrook forms an elevated trough, capped by a plateau of basalt, which covers the strata here. South-west of the Cornbrook rocks, and at a considerably lower level, is a small basin of elliptical form, called the Knowlbury field, which is distinctly broken off from the great field of Cornbrook. This basin is completely exempt from basalt, except that its surface is partially encumbered with fragments of that rock. At Cornbrook and Knowlbury there are four principal beds of coal, which vary in thickness in different parts; and beneath the uppermost bed the shale contains concretions of ironstone of excellent quality, which also occur beneath the next seam. In the Cornbrook tracts the coal is worked by shafts sunk through the overlying basalt, which varies in thickness from twenty to sixty-four yards. In the Knowlbury basin the lower beds of coal and sandstone crop out on the west at angles of about 30°, resting on the old red-sandstone. In the centre of the basin the shafts are sunk to a great depth, the new pit being 220 yards deep. This coal-field is traversed by two principal and several minor faults, the prevailing direction of which is from north-east to south-west. The millstone-grit rises at many points from beneath the productive coal-field. It is most expanded to the north, where it is separated from the old red-sandstone by the carboniferous limestone at Oreton; but in other parts, where the latter formation is wanting, it rests immediately upon the sandstone. It has a thickness of several hundred feet, and is inclined at high angles near its exterior margin, the inclination decreasing as it passes beneath the coal-seams. The mountain limestone, as before mentioned, occurs near the northern and southern extremities of the tract, where it lies between the millstone-grit and the old red-sandstone. The thickness of the strata never exceeds sixty feet. Titterstone, the highest point of these hills, is composed of a pure basalt, and has an elevation of 1730 feet above the sea. 'The iron-ores, and the limestone with which they are associated in these hills, are,' says Mr. Murchison, 'very superior in quality to those of the great Staffordshire field and at first sight it appears surprising that these valuable products should not be turned to better account. They are however excluded from fair competition by the want of means of transport; and it is painful to record, that with all the spirit and enterprise which can be bestowed on such works, the manufacture of iron in the Clee Hills is attended with little profit. Vast heaps of the finest ore have lain unheeded for many years on the high grounds of the Brown Clee; and it is only by the actual juxta-position of the coal, iron-ore, and lime, at Knowlbury, in a lower and more favourable position, that Mr. Lewis (the proprietor) is enabled to sell, though at a very small profit, a manufactured article of the very first quality. The construction of canals or railroads would soon render the Clee Hills the centre of wealth and industry.'

The coal-field of the Brown Clee Hills lies a few miles north of the formation just described, and, like that, is surrounded on all sides by the old red-sandstone, which here separates the coal-measures into two distinct elevations, known as the Clee Barf and the Abdon Barf. These two carboniferous tracts are the loftiest in Great Britain. The sandstone rises to a considerable height upon the flanks of the hills, and dips inwards, upon which repose the strata containing seams of bad coal of slight value, the summits being composed, as at Cornbrook, of basalt. In some parts there are thin beds of coal, having a total thickness of seven or eight feet. In the lower part of the series, ironstone nodules occur. The lowest coal rests upon a sandstone, the equivalent of the millstone-grit which reposes on the old red-sandstone, without any traces of carboniferous limestone. The pits on the Abdon Barf are shallow. Those of the Clee Barf vary from 14 to 80 yards, and are all worked by the common windlass. Nearly all the best coal has been extracted. The coal-measures are intersected by a vast number of faults, trending from north to south and east to west.

In this coal-field, as at the Titterstone Clee Hill, there is abundant evidence of the tract having been heaved up into its present position by powerful forces acting from beneath, which have thrown the carbonaceous masses into separate troughs or basins.

The coal-field of Wyre or Bewdley Forest lies east of those just described, occupies the south-eastern corner of the county, and extends into Worcestershire, the greater part of it lying within that county. It has a length from north to south of about 20 miles, and a breadth in the Forest of Wyre of five or six miles. That portion of it lying in Shropshire and extending southward in a narrow zone from near Bridgnorth, is bounded on the west by the old red-sandstone of Chelmarsh. This band contains at least three seams of coal, of which only one is worked, and that, like the rest of this field, is of an inferior sulphureous quality. At Kinlet, where the coal-measures occupy a greater width, a greenstone trap occupies some of the highest ground.

An examination of these coal-fields of Shropshire has enabled Mr. Murchison to lay down the following data as respect to them, independently of the phenomena resulting from igneous action and disturbance:—

1. The proof of a younger zone of coal passing upwards and conformably into the lower members of the new red-sandstone, and containing within it a peculiar freshwater limestone, always occupying in a long course the same position.

2. The Coalbrook-dale field has been shown to contain not only this upper carbonaceous zone, but further, a full development of the older coal strata, charged with a mixture of freshwater, terrestrial, and marine remains, indicating an æstuary origin. These beds however pass down in two localities into bands of true mountain limestone, containing exclusively fossils of marine origin.

3. The Clee Hill coal-fields consist of only the lower carbonaceous masses, reposing upon millstone-grit and carboniferous limestone. These therefore were probably accumulated in a bed of the sea.

4. In the northern extremity of the Forest of Wyre, where the passage upwards into the new red-sandstone is clearly marked, no volcanic eruptions having there burst forth to obscure the succession of the stratified deposits, a large portion of carbonaceous masses is thus proved to belong to the younger zone of coal-measures; but the order of succession beneath them is not complete; for the carboniferous limestone being absent, the coal reposes directly upon the old red-sandstone or Silurian rocks.

5. The fields of Shrewsbury and Coalbrook-dale were originally deposited upon rocks of all ages, from the slates of the Cambrian system to the carboniferous limestone included, the latter case being the exception, and not the rule, as in other parts of England.

The old red system, which Mr. Murchison has divided into three formations—which in a descending order are: 1, quartz on conglomerate and sandstone; 2, cornstone and marl; and 3, tilestone—occupies a considerable part of the southern division of the county. It is here the northern prolongation of that great tract of sandstone which occupies such large portions of the counties of Monmouth, Brecknock, and Hereford, and part of Worcester, and enters this county from the south. Its northern extremity terminates in the coal-field of Coalbrook-dale, and on the east in that of the Forest of Wyre, with the exception of the space lying between those two coal-fields where the old and new red systems meet. On the west it is bounded in Corve-dale by the upper Ludlow rock of the Silurian system. The three subdivisions above mentioned are met with in this county, but the middle, or cornstone, is the most prevalent, and affords lime of an inferior quality. Organic remains of various kinds are abundant in the tilestone group, while those of the upper division are confined to a few land-plants. At Hayton's Bent, north of Ludlow, veins of copper-ore occur, which were formerly worked, but have been abandoned for upwards of one hundred years. A large outlier of old red-sandstone, the principal part of which forms Clun Forest, occurs on the south-west of the county, and is separated from the great mass by wide intervening tracts of Silurian rocks. This outlier is nearly one hundred square miles in superficial extent. Its western extremity reaches into Radnorshire.

The portion of the county now left undescribed, and comprising about one-fourth of its surface, is composed of the stratified rocks of the Silurian and Cambrian systems. These occupy the southern division of the county lying west of a line drawn from Ludlow to the Severn at Coalbrook-dale.

The Ludlow rocks rise from the old red-sandstone of Corve-dale into eminences of 1000 or 1100 feet above the sea, exhibiting the subdivisions of the formation, viz. the upper Ludlow rock, Aymestry limestone, and lower Ludlow rock. West of these, and separated by Hope-dale, is that unbroken escarpment extending from the valley of the Onny to Coalbrook-dale, called Wenlock Edge, and composed of Wenlock limestone. This is succeeded by Wenlock shale, composing the valley east of the Caradoc or Church-Stretton Hills, which consist chiefly of different varieties of unbedded or amorphous trap, flanked on the east and west sides by Caradoc sandstone. On the north-eastern extremities of these Silurian rocks, west of Church Stretton and north of the Onny, is an elevated and extensive tract of rocks of the Cambrian system, composing the Longmynd and other mountains, with outbreaks of trap, and these are again succeeded by Caradoc sandstone, the altered and irregular ridge of the Stiperstone, and the trap rocks of Shelve and Corndon. A vast expanse of Ludlow rocks then succeeds, and extends into Montgomeryshire, and this formation occupies nearly the whole of Shropshire lying south and west of the Onny, the outlier of old red sandstone above described forming an exception. The Silurian and Cambrian rocks above described, between the old red-sandstone of Corve-dale and Montgomeryshire, have a general direction from south-west to north-east, and we have seen that the coal-fields of Coalbrook-dale and Shrewsbury wrap round their northern edges. Many interesting geological phenomena occur in the Silurian rocks and the varieties of trap associated with them. Among the trap and sandstones of Shelve and Corndon occur several metalliferous veins, containing ores of lead, &c., of considerable value.

The trap-rocks of the Wrekin, &c., as in the other volcanic districts, have disturbed and altered the adjacent strata, and from observing these phenomena, and the dislocations of Coalbrook-dale and the Clee Hills, 'it may,' says Mr. Murchison, 'be affirmed that this district in Shropshire furnishes proofs of the alternate play and repose of volcanic action during very long periods. These evidences demonstrate, 1, that volcanic grits were formed during the deposition of the lower Silurian strata; 2, that the Upper Silurian rocks and old red-sandstone were accumulated tranquilly without a trace of contemporaneous eruptions; 3, that after their consolidation, the last-mentioned deposits were dismembered and set upon their edges by vast outbursts of intrusive trap; 4, that the carboniferous system was deposited after the older strata had been upheaved; 5, that subsequent dislocations, including some of the most violent with which we are acquainted, took place after the accumulation of the coal-measures and lower new red-sandstone.'

The superficial deposit or drift of the part of Shropshire lying south of the Severn is principally derived from the Silurian rocks on the west and north-west; that of the north of Shropshire consists of masses of sand and gravel derived from the underlying new red-sandstone, and in the neighbourhood of the coal-fields this is often mixed up with detritus derived from the coal-measures, &c.

On the surface of these local accumulations in Northern Shropshire there occurs in some places a foreign detritus composed of granitic bowlders, derived from Cumberland or Scotland, and marine shells of existing species are often found mixed up with them. The bowlders occur both isolated and in groups, being numerous on the northern face of Haughmond Hill and the north-western slopes of the Wrekin, and isolated in the district lying a few miles south of Shrewsbury. Further observations and deductions respecting the occurrence of this foreign drift will be found in the article Severn.

Mineral Springs.—There are numerous saline springs issuing from the new red-sandstone of North Shropshire. They occur at Smeithmore, Kingleywick, Admaston, Moreton Say, &c. These springs are not however confined to the new red system, for they are met with in the coal measures at Broseley, and at Sutton near Shrewsbury. At the latter place, in addition to the saline ingredients, there is a considerable proportion of chloride of lime. A saline spring, called *Saltmoor*, occurs also at Ashford, on the banks of the Terne below Ludlow, from which, at the period of the Norman conquest, it appears salt was manufactured, as is said to have been formerly the case with the springs at Broseley. The Saltmoor well issues from the old red-sandstone, and its geological relations and phenomena seem to correspond with the valuable wells lately discovered at Tenbury in Worcestershire, close to the Shropshire border. The medicinal virtues of the latter are however of far greater interest and importance, as, in addition to the saline matter, chloride of lime, and iodine and bromine, are found in unusually large proportions. The connection between these springs at Tenbury, Saltmoor, &c., and the intrusive basaltic rocks at the Clee Hills, affords an interesting subject for geological inquiry.

On Prolley Moor, on the western side of the Longmynd, there is a spring of which chloride of lime appears to be the principal ingredient. Chalybeate springs occur near Sherlot Common, in the neighbourhood of Wenlock, at Moreton Say, and other places.

Soil and Agriculture.—The soil of the county on the right bank of the Severn is chiefly a red clay and gravel, derived from and overlying the new red-sandstone formation; it is favourable for many kinds of agricultural produce. The hundred of Bradford North consists of this clay and gravel with sand, and a considerable quantity of peat, with some good meadow land in the lower portions. In Bradford South and Brimstry hundreds, a red sand prevails throughout, with the exception of the district in the neighbourhood of Coalbrook-dale. Pimhill hundred consists of this and some boggy land, with however a large proportion of good wheat land. Farther west, towards Oswestry and the borders of Denbighshire, there is a coarse gravel mixed with the prevailing red clay, and some boggy and peaty land, which has however been diminished by draining. This red clay does not extend in any considerable degree south or west of the Severn, although a red clay of a somewhat different character prevails over the greater portions of the franchise of Wenlock, and the hundreds of Stottesden, Overs, and Munslow. This clay lies over the old red-sandstone, which contains beds of impure limestone, and which is burnt and used as a manure to a considerable extent. It forms some of the best land in the county. In the three last-named hundreds lie the coal-fields of Bewdley, and the Titterstone and Brown Clee Hills. The hundreds of Condover, Ford, and Chirbury have a prevailing deep light-coloured loam, with sand and gravelly clay. The south-west portion of the county is the least productive, comprising the hundreds of Purslow and Clun. The ground is too steep and elevated, and the soil too light to admit of general cultivation. The valleys consist of loam, resting on gravel, and forming good meadow and pasture land.

The relative quantities of pasture and arable land, and the proportions in which grain and the various kinds of agricultural produce are cultivated, vary of course with the situation of the farms and the nature of the soil. The farms are for the most part arable, but some are for grazing, for hay, for the dairy, and for rearing and feeding. The crops in general cultivation are, wheat, barley, oats, peas, vetches, and turnips, to which may now be added potatoes (though these last are chiefly consumed by the farmer as food for his stock), and, in a few places, beans.

The following are the various rotations of the crops:—1, Wheat, barley, clover; 2, Peas, wheat, barley, clover; 3, Wheat, turnips, barley, clover or peas; 4, Wheat, barley, turnips, barley, clover; 5, Peas or vetches, wheat, oats, clover; 6, Fallow, wheat, oats, clover; 7, Pasture, oats, fallow, wheat, oats, clover; and in some places where the soil is not adapted for turnips the rotation is as follows:—1, Fallow, wheat, clover, oats or peas, fallow; 2, Fallow, wheat, oats or barley, clover, peas or vetches, fallow; 3, Fallow, barley, clover, wheat, fallow.

In the neighbourhood of Shrewsbury, upon a pebbly loam of some depth, resting upon gravel, the following plan has been pursued with success:—The clover leys were ploughed and sown with wheat in October, or early in November, and covered with a light dressing of lime and soil prepared for the purpose. When the wheat was cleared off, the stubble was ploughed in, and sown with turnips, which were eaten by sheep in December. Early peas were sown in the beginning of February, and carried off by the middle of July, when the land was immediately manured and sown with turnips; the largest of which were removed off the ground in December, and the rest eaten by cows, sheep, &c. In the following spring barley and clover were sown, and mown or eaten in summer. By this plan it is said the lands were kept free from weeds, and never required to be fallowed. The produce was about twenty-six bushels of wheat per acre, and as many of peas.

The following course of crops was formerly not unusual: fallow, wheat, oats for two years; the second year's crop was sown with clover, which was suffered to remain two or three years, while fresh land or a clover ley of three years' growth was broken up for oats or a fallow. If barley was introduced, it was after the wheat, and before the oats.

The introduction of turnips in the place of fallows is a main feature in the improvements effected in the cultivation of the farms. Where however the land is too heavy and strong for turnips, the fallows are commenced at various periods, but the greater part of them are not sufficiently worked or cleaned. Many farmers however begin their fallows in January, and by repeated ploughings, harrowings, and rollings, bring them into very good order for wheat. In other cases the first ploughing is not performed until May or June; the next in August; and in September the land is again ploughed and harrowed, and sown in the end of October. By this means it is evident that land cannot be well cleaned, unless great labour and diligence be used. In general however, after a stubble, the land is ploughed before Christmas, and has at least three more ploughings in the course of the summer. After clover it is grazed in the spring with sheep, and not ploughed until June, or sometimes the clover is mown and a tolerably good fallow made previous to October.

Wheat is sown in October, and on good land not until the middle of November. From two to three bushels per acre is the quantity sown, according to the proportion and quality of the manure employed. The wheat is first steeped in salt and water, and subsequently sprinkled with lime. Where wheat succeeds a clover ley, dung is spread upon the latter, and ploughed under; but sometimes the manure is carted, and spread after the seed is harrowed in. If lime is the manure employed, it is either spread upon the clover in July or harrowed in with the soil during the summer. Summer fallows for wheat are manured with dung or lime; but if turnips are to succeed wheat, no manure is used for the latter. Wheat, as well as other grain, has heretofore been sown broad-cast, but drilling is now becoming general in many parts of the county, and dibbling has been recommended. It is sometimes eaten a little in the spring with sheep, and harrowed once or twice in May or June. The crop varies from ten to twenty-five bushels per acre. Buckwheat is sown on light soils from the middle to the end of May, which allows time for the ground to be well cleaned. Wheat is generally reaped with broad hooks or saw sickles, but some is mown.

Barley is sown from the latter end of March to the beginning of May. Two and a half bushels an acre is about the average quantity of seed sown. Upon strong soils, when barley succeeds wheat, the latter stubble is ploughed under about Christmas. Upon such soils the land is rendered fit by the frost for working with the harrows at seed-time. If barley however succeeds wheat, on sandy, gravelly, or pebbly loams, three ploughings are often given; and after turnips, either one or two ploughings. The produce is from twenty to forty bushels per acre.

Oats are commonly sown after wheat, and often, upon stiff soils, with only one ploughing, and succeed well. They are also sown upon the turf with one ploughing. Barley as well as oat crops are mowed.

Peas are perhaps more grown in Shropshire upon sound soils than in most other counties, but are regarded as a very uncertain crop. They are sown in March, from two to three bushels per acre. They are frequently sown upon old pastures or clover leys, with one ploughing. The produce varies from ten to twenty-four bushels per acre. They are used as food for horses, and for fattening pigs. Vetches are cut green for horses in the stable. If left for seed, they are succeeded by a crop of wheat.

Turnips were formerly chiefly cultivated on the east side of the county, but their growth has lately been much extended and encouraged by the principal farmers and the landed proprietors, who have given premiums for that purpose, so that now they form a regular crop wherever the soil will admit of their profitable cultivation. They are sown from the middle of June to the beginning of July. The land is previously well manured and cleaned by frequent ploughings, commencing before Christmas. The quantity of seed used is one pound to an acre. The plants are twice hoed, and the produce varies from ten to twenty tons per acre. Where the soil is sandy and dry, the turnips are not removed from the field, but are eaten by sheep or young cattle. For this purpose they are sometimes removed to an adjoining stubble or ley. In other cases they are drawn home and stacked for winter use.

The cultivation of the potato has also been on the increase of late years. In the neighbourhood of towns, where manure can be procured, and the potatoes easily conveyed to market, this vegetable should be made a staple article of cultivation. It is also found to be an excellent food for cows, producing in winter, with a very small quantity of good hay, a plentiful supply of good milk. In some cases this crop is immediately preceded by wheat. The exhaustion of the soil by the potato has been proposed to be remedied, or rather avoided, by the following plan:—A wheat fallow to be ploughed in two, three, or four bout ridges, dung to be put in the furrow, and on the dung the potato sets to be placed, and a bout ploughed on them. A ridge is thus formed, giving the manure and a double portion of earth for the plant to root and grow in. The remaining part of the land would form alleys in which, during the summer, the operation of the plough would make the fallow; and thus crop and fallow be obtained without injuring the land, for the fallow would be amended by whatever extra care was bestowed upon the potato crop beyond the tillage usually given to the summer fallow. Thus two most important articles of food (wheat and potatoes) might be had with the same tillage, and from land that would otherwise be unproductive.

Beans are not much cultivated, which has latterly been the case also with rye, although that was formerly considerably cultivated on the sandy loams, where wheat has since taken its place, owing perhaps to a change in the soil, arising from the quantity of lime used on it.

Some hemp and flax are cultivated in the county.

Hops are scarcely known, except on the southern edge of the county adjoining Herefordshire; but to show that their extended cultivation is not impracticable, it may be mentioned that a hop-yard was formed in the parish of Ditton-Priors, west of the Brown Clee Hills, and kept up six years, beginning in the year 1830: it produced on an average about 4 cwt. per acre; two years were total failures, which was the case throughout England. It answered on the whole tolerably well. A good orchard has risen up on the ground formerly occupied by the hop-yard.

The grass-land is the portion which receives the least attention at the hands of the farmer. He is apt to think all or nearly all his manure is most called for on the arable land, and consequently bestows little or none on the pastures and meadows. Irrigation is however extensively practised, and with the greatest advantage.

The meadows adjoining the Severn, and other rivers and streams, are rich, and are often overflowed; and the water lies on them, especially near the Severn, for a considerable time. The fertilizing effects of these floods are very great, and of value to the farmer, when occurring, as they generally do before the grass is in a forward state, or after it has been mown and removed. Sometimes however a flood occurs near the period of hay harvest, when the effects are most disastrous, the crops in that case being often wholly destroyed. To prevent this, recourse has been had, in the upper portion of the Severn, to embankments, and as the total exclusion of the flood water would perhaps be a worse consequence than the evil prevented, where attention is paid to this point care is taken to place flood-gates, which are shut or opened according to the period of the year. Of so much importance is irrigation esteemed, that an act of parliament was passed about fifty years since, to compel the landholders on the banks of a stream called the Rea, near Shrewsbury, to adopt a uniform system, by which the benefit of the waters might be obtained, as well as its evil consequences more effectually prevented.

When manure is bestowed on the grass-land, it is generally carried out in the winter, during hard frosts, when the land is hard and the teams are not wanting for other purposes. The time however when the manure is most efficacious is immediately after the hay is removed. The meadows are shut up for a crop about Candlemas, and generally mown in July. The most common grasses are *anthoxanthum odoratum, phleum pratense, alopecurus pratensis*, &c.

This county is not remarkable for its dairy produce, although a ready sale is obtained for cheese and butter at the market-towns, where they are purchased by dealers and carried to the manufacturing districts of Wolverhampton, Dudley, and Birmingham, and large dairies are therefore to be found on some of the farms situated within reach of the markets. The cheese is, generally speaking, of an inferior kind, but that made on the northern part of the county, on the borders of Cheshire, must be deemed an exception, where more attention is paid to this department and the dairies are larger. The cattle are reared from the improved breeds of Lancashire, Cheshire, Leicestershire, and Staffordshire. In the neighbourhood of Bishop's Castle there is a good breed of cattle, the colour a dark red; in the south the Herefordshire breed is becoming more common. On some large farms and gentlemen's estates the Devonshire, Alderney, and other breeds are introduced and bred for the purposes of the dairy. On the north-east side of the Severn the breed of cattle is an inferior sort of the Lancashire long-horn, and principally for the dairies, and most farmers throughout the county rear a few calves every year for the same purpose, and in some cases the breeds are improved by the purchase of bulls from Leicestershire and Lancashire. The Leicestershire breeds, so termed, are very quick feeders, but appear less adapted to work than those of Herefordshire and Devonshire. When the intention of the farmer is to rear calves, it is deemed advantageous that the cows should bring them in February or earlier, but when intended to fatten for consumption, a month or two later is considered the most desirable time. The manner of feeding the calves varies: some give oatmeal, wheat-flour, or oil-cake with milk, while others give them hay and oats, or turn them out to grass at an early period. The calves intended for the market are generally suckled until sold. Where the land is of an inferior kind, it is considered good management to rear as many calves as are requisite to keep up the stock of cows. The cows are generally housed and tied up during the winter. There are some horses bred in Shropshire, as well for the road as the plough, but of no particular breed. The waggon horses are generally of a strong black sort. In some parts of the county the farmers keep cart stallions, and breeding mares constitute a portion of almost every team, by which means the stock is continued on the farms, and several useful horses brought to market. Some saddle horses are also reared. On Clun Forest and the Longmynd a small hardy race is reared approaching to the character of the Welsh pony. At Walcott, the seat of the earl of Powis, a variety of breeds were introduced about 50 years ago by Lord Clive. On the east side of the county a great portion of the horses are supplied from Derbyshire and Leicestershire. Oxen are used for the plough to a considerable extent, although not so much as formerly. They are preferred for ploughing in the stiff land, but horses for all road-work. Five oxen are generally used in the plough, in single gearing, or four oxen with a horse to lead. In a few cases they have been used in waggons.

The sheep of Shropshire are various, according to the fancy of the farmer. Most of the sorts in England may be found in one portion or another of the county. The old Shropshire sheep are horned, with black or mottled faces and legs. Their size is nearly that of the South-Down; but the neck is longer, and the carcass not so compact. They are nimble and very hardy, and are not supplied with much dry food except during long snows. This sort abounds on the Longmynd. They weigh near 10 lbs. per quarter when fattened. Their fleeces weigh from 2 to 3 lbs. The small Welsh breed, of 5 or 6 lbs. per quarter, exists here, as well as the Leicestershire, of six times the weight. Upon the hills towards Wales the sheep are without horns, with white faces and with shorter legs, and heavier but coarser fleeces than the Shropshire sort. They weigh about the same. The farmers in the neighbourhood of the hills and commons prefer the cross of the South-Down with the Longmynd, the produce being as hardy and biting as close as the latter, while the wool is improved and the weight of the sheep increased. The expense of procuring winter-food for the hill flocks takes off much of the profit. The sheep are not generally folded. Pigs and hogs are fattened and reared to a great extent. The original hog of the county, a high-backed long-eared animal, has been crossed by various breeds, and is now rarely to be met with unmixed. The Chinese breed has diminished as the Berkshire and Leicestershire have been introduced.

There is not much cider or perry made in the county. The orchards are chiefly confined to the south and south-east borders.

The size of estates and farms in Shropshire, as in other counties, varies considerably. There are estates of from 10,000 to 30,000 acres, and numbers of all inferior sizes. The farms generally vary from 100 to 1000 acres; and on the west, on the borders of Wales, there are many little farms not exceeding 20 acres. It may be stated however that the farms are larger and more consolidated than formerly, two or three being often put into one.

Mining Industry and Manufactures.—The rich coal-formations of this county and the iron-stone associated with them give employment to several thousand persons. The number of labourers employed in labour not agricultural or connected with manufactures other than that of iron was, in 1831, 11,585. The greater portion of these are engaged in raising coal, ironstone, and lime, and in the manufacture of iron, and a few in the lead-mines on the western hundred of Brimstrey which is surrounded by Worcestershire and Staffordshire, and is about twelve miles from the nearest part of Shropshire. The population of the whole parish, in 1831, was 11,839, of which 9765 were comprised in the Shropshire portion. The town was formerly remarkable for its great abbey of Præmonstratensian canons, which was built in the reign of John. The remains of the building are now trifling; but from the foundations that can be traced, it must have been of considerable extent. St. Kenelm's Chapel in this parish is an antient building consisting of a single aisle and tower. There is a legend in connection with this building, that Kenelm, the only son of Kenulf, king of the Mercians, was murdered on this spot in the ninth century by his guardian, through the artifice of his sister, who subsequently took possession of the kingdom, and that the whole of this transaction was miraculously revealed to the pope at Rome, and the chapel of St. Kenelm erected on the spot where the murder was perpetrated. A portion of the chapel bears traces of great antiquity, and the tower is an elegant specimen of Gothic architecture.

The town is pleasantly situated in a valley, and contains many good houses. The church is a fine building, with a beautiful spire supported by four arches. About five hundred persons are employed in manufactures, which principally consist of nails and various sorts of hardware. There are two fairs held here in the year, and one at St. Kenelm. The living of Hales-Owen is a vicarage, the annual value of which is about 700*l*. The perpetual curacy of Oldbury is in the gift of the vicar for the time being of the parish, and is worth 150*l*. per annum. In the vicinity of Hales-Owen is the Leasowes, the birth-place and residence of the poet Shenstone. The grounds were laid out under his superintendence with excellent taste, but after his death they were much neglected. The poet was buried in the churchyard of Hales-Owen, and within the church is a monument to his memory. There are four day-schools, one of which is a free grammar-school for forty boys. Another is endowed for the education of twenty-two poor children. There are one boarding-school and seven Sunday-schools, two in connection with the Established Church, two with Baptists, two with Methodists, and the other with Independents. These Sunday-schools are supported by subscription, and contain altogether about eight hundred children.

Although Madeley, or Madeley-Market, was at one time remarkable for its excellent market, it can no longer be called a market-town, the market having been removed to Coalbrook-dale, about two miles from Madeley; but as it is still held within the parish, and as under this head it is intended to make some mention of the celebrated district of Coalbrook-dale, Madeley may be properly noticed among the principal places within the county.

The population of the parish of Madeley, in 1831, was 5822. It is situated within that extensive district known as the borough of Wenlock. It lies on the north side of the Severn, about sixteen miles from Shrewsbury.

Madeley does not appear to be a place of great antiquity, and it owes its rise and population to the extensive coal and iron works in the vicinity.

Coalbrook-dale is situated about two miles from Madeley, and lies in the valley of the Severn. The iron-works here are the most extensive in England. Coal is also raised in considerable quantities. In 1831, 350 men were employed in mines and coal-pits in the parish, but the number employed in the furnaces has not been ascertained. It may however be estimated that from 8000 to 10,000 persons are so employed in the iron-works of the district, which are not confined to the parish of Madeley, but extend to Lilleshall, &c. By means of the Severn and the various canals previously described, the products of this vast manufacturing district are exported and distributed. This valley contains the first iron bridge erected in the country. It is over the river Severn, and consists of one arch, with a span of 100 feet 6 inches. It is composed of five ribs, each rib formed of three concentric arcs, connected by radiating pieces, each piece weighing 5 tons 15 cwt. The width of the roadway is 25 feet, and the height from the base-line to the centre of the bridge is 40 feet. The total weight of iron employed in the structure is 378 tons 10 cwt. It was erected in 1779, in a space of little more than three months. The success attending this experiment induced, in 1796, the erection of a similar bridge, from a plan of Telford's, over the Severn at Buildwas, about two miles above Coalbrook-dale. The span of this arch is 130 feet. In the neighbourhood of Madeley there is a manufacture of coal-tar carried on. The spring of petroleum, or fossil-tar, at Broseley, is noticed under the article Broseley. The manufacture of china and other ware at Coalport has been noticed in treating of the manufactures of the county. There are three annual fairs at Madeley. The living is a vicarage, of the average net income of 241*l*.

There were two infant-schools and eighteen day-schools in this parish in 1835. To one of the latter, containing about 100 children of both sexes, a lending-library is attached, to which children and any other persons may have access on payment of 1*d*. per month. In the remaining seventeen schools there are about 500 children, and in all of them the education is at the expense of the parents. There are six Sunday-schools, three in connection with the Established Church, the remainder with Wesleyan Methodists. Small libraries are attached to two of the former, and in all of them the instruction is gratuitous. A house of industry was built on some charity lands here, and leased to the churchwardens and overseers for the use of the poor at a rent of 18*l*., which is applied in clothing for the poor.

Newport is a small market-town and borough on the borders of Staffordshire, and in the Newport division of the hundred of South Bradford. The population of the borough, which is co-extensive with the parish, in 1831, was 2745. This place formerly belonged to the Audleys, and subsequently to a family of the name of Newport, to whom it gave the title of baron. The abbot and convent of St. Peter and St. Paul, at Shrewsbury, were patrons of the church of Newport, and from them it was purchased in the reign of Henry VI. by Thomas Draper, a citizen of London, who made it collegiate, placing in it a custos, who was the parish priest, and four fellows. The establishment falling into the hands of the crown on the dissolution of religious houses, the college property was afterwards granted by queen Elizabeth to private individuals. A portion of the present church appears to be of the fifteenth century, and the interior bears traces of great beauty; but the side-aisles having been rebuilt with brick, the building presents a most incongruous appearance. Newport sustained great damage in 1665 by a fire which consumed 160 houses.

The only manufacture carried on here appears to be that of stockings.

The existence of the corporation can be traced as far back as the reign of Henry III. There are no courts, criminal or civil. The only gaol consists of a lockup-house, in which prisoners are confined previously to commitment to the county gaol. The income of the corporation is from 30*l*. to 40*l*., arising from land, and is applied to charitable purposes, and to keeping in order cisterns and conduits which supply the town with water, and to improvements in the town. In 1446 the burgesses caused an almshouse to be erected and endowed for the support of four old women. The present annual income is about 70*l*. There are six fairs held here annually. The living is a perpetual curacy, endowed with the rectorial tithes, and is of the net annual value of 275*l*.

There is a free grammar-school, mainly supported by the endowment of William Adams, who, in 1756, conveyed lands to the governors of the school for that purpose, and also for erecting and endowing an almshouse. The annual income of the whole charity is upwards of 1300*l*. There are 30 boys in the school on the foundation, and the master receives a salary of 175*l*. per annum. A library is attached to the school, which is a handsome brick building. A scholarship at Christ Church, Oxford, of 80*l*. a year, payable for seven years, and four smaller scholarships, unrestricted as to college or university, are attached to this school. There are eleven other day-schools, in all of which, with the exception of one, which is partly supported by endowment, the instruction is at the expense of the parents. There are two Sunday-schools; one, connected with Independents, has a small lending-library attached.

Shiffnal, sometimes called Idsall, is also near the border of Staffordshire, and is in the Shiffnal division of the hundred of Brimstrey. In 1831 the parish, comprising the townships of Hatton and Woodside, and chapelry of Prior's Lee, contained 4779 persons. There are three fairs here in the year. The town is situated on the London and Holyhead road: it contains but little to interest the traveller. The parish church is a large and interesting cruciform building, and contains a fine altar and some monuments. In the chapelry of Prior's Lee, between 300 and 400 men are employed in mines and coal-pits. The living of Shiffnal is a vicarage, of the net annual value of 450*l.* Prior's Lee is a perpetual curacy, in the gift of the vicar of Shiffnal, with an income of 139*l.* per annum.

There is one infant-school; eight day-schools, one of them partially endowed, another a national school, and in the remainder the instruction is at the expense of the parents; and two Sunday-schools, with a small lending-library at the church.

Shiffnal is the birth-place of Dr. Beddoes.

Stretton, commonly called Church Stretton, is supposed to derive its name from Street-town, so called because it is situated close to Watling Street. It is in the hundred of Munslow. The town is small; the population of the entire parish, in 1831, was only 1302. The town lies in a narrow valley, bounded on one side by a picturesque range of hills known as the Caradoc Hills, and on the other by the Longmynd. Caer Caradoc, one of the Caradoc Hills, has entrenchments on its summit, and was one of the military stations of Caractacus. It was at one time supposed to be the place where that chief fought his last battle; but that supposition was subsequently abandoned, as the situation does not correspond with the description of Tacitus. Another of these hills also has deep entrenchments, called Brocard's Castle. The town contained a picturesque market-place and town-house of the Elizabethan age, which has however been recently removed. Five fairs are held here annually. The turnpike-road from Ludlow to Shrewsbury passes through this place. The living is a rectory, with an income of the annual value of 542*l.* There are two infant-schools and three day-schools here: one of them, called the free-school, is partly supported by funds accruing from bequests. There is also one Sunday-school.

Wellington is situated in the hundred of South Bradford, near the base of the Wrekin, and in the populous district of the iron-mines and coal-pits. The number of persons in this parish in 1831 was 9671. Here Charles I., in 1642, on his route from Nottingham to Shrewsbury, collected his troops, and in order to prevent the growing disaffection amongst them, declared that he would support the reformed religion, govern by law, uphold the privileges of parliament, and preserve the liberty of the subject.

The town is neat in its appearance, and has an excellent market on Thursday and a fair every month. The church is a handsome modern structure.

In 1831, 1011 men were employed in coal and lime pits in this parish.

The living is a vicarage with the rectory of Eyton united, with a net income of 842*l.* There are thirteen day-schools, in eleven of which the instruction is at the expense of the parents, the other two are supported by subscription and a small endowment; nine Sunday-schools, two connected with the Established Church, three with Methodists, two with Baptists, and two with Independents, and all supported by voluntary contributions.

Wem lies on the road between Shrewsbury and Whitchurch, about 10 miles north of the former town. The parish, which in 1831 contained 3973 persons, is partly in the hundred of North Bradford and partly in Pimhill hundred. The manor of Wem falling to the crown in consequence of the attainder of Philip Howard, earl of Arundel, James II. conferred it on the notorious chancellor Jefferies, who was created Baron Wem. The title became extinct with his son.

The town is pleasantly situated near the source of the river Roden. It consists principally of one large open street. In addition to the weekly markets, six fairs are held here annually. The church is a handsome structure with a lofty steeple and a fine chancel. The living is a rectory, to which is annexed the chapelry of Edstaston, with a net annual income of 1767*l.* There are one infant and seven day schools. One of the latter is a free grammar-school, founded and endowed by Sir Thomas Adams. It contains 30 boys. A scholarship of 80*l.* per annum at Christ Church, Oxford, is attached to this school. One national school contains about 200 children. In 1835 there were four Sunday-schools, all connected with dissenters: a lending library is attached to one of them.

Sir Thomas Adams, mentioned as the founder of a grammar school, was born here in 1586. He was brought up as a draper in London, but received his education at the University of Cambridge. He was elected lord mayor of London in 1645. Being a warm partizan of Charles I., he was sent to the Tower, where he was confined some time. He is said to have subsequently sent large sums of money to Charles II. while abroad, and he was deputed, previous to the Restoration, to accompany General Monk to Holland to attend Charles on his return to England. He was soon afterwards created a baronet, and died in 1667. He founded a professorship of Arabic in Cambridge, which was for some time held by Abraham Wheelock, at whose suggestion Sir Thomas Adams went to the expense of printing and diffusing the Persian Gospels.

Wenlock, sometimes called Great or Much Wenlock, to distinguish it from Little Wenlock, is situated in the borough of Wenlock, and about 13 miles south-east from Shrewsbury. The population of the parish in 1831 was 2424. Wenlock abbey is the object of greatest interest in this neighbourhood. It was founded about the year 680 by Milburga, of the family of one of the kings of Mercia, and she presided over it as abbess. It was subsequently destroyed by the Danes, and restored by Leofric, earl of Chester, in the reign of Edward the Confessor. It was again destroyed by the Danes, and was forsaken, but in 1080 Roger de Montgomery, earl of Arundel, according to William of Malmsbury, rebuilt and endowed it. The last refounder placed in it a prior and congregation of monks from Seez in Normandy, who were regarded as a cell of the house of De Caritate in France, and it suffered the fate of other alien priories by confiscations and exactions until the reign of Richard II., when it was naturalized. In the reign of Henry VIII. it was granted to Augustino de Augustino. Isabel de Say, lady of Clun, had endowed it with the church of St. George at Clun, and seven dependent chapels, which grant was confirmed by Edward III.

The ruins of this abbey are situated in a valley on the south side of the town, adjoining the churchyard. The remains are considerable, and prove the building to have been of the early Gothic of the thirteenth century. The whole length from east to west was 401 feet, and the breadth of the nave and aisles 66 feet, and the edifice and precincts must have included 30 acres.

The borough of Wenlock comprises seventeen parishes, which are scattered over a considerable extent of country. The borough was first incorporated by Edward IV. This charter conferred on the burgesses the privilege of returning one member to parliament, and is said to be the first instance of that privilege being conferred by charter. A subsequent charter was granted by Charles I. Under the Municipal Corporation Act the borough consists of three wards, with six aldermen and eighteen councillors. The boundary of the borough has not been altered for any purpose. It now returns two members, whose return, until the passing of the Reform Act, was vested exclusively in the burgesses. The number of the constituency in 1839-40 was 949, of which 142 were burgesses. The population of the whole borough in 1831 was 17,435. The corporate magistrates hold a petty sessions at Wenlock, which is the seat of the municipal government, every alternate week, and a general sessions twice a year. Capital offences were formerly tried before this court; about a century ago three persons were sentenced to death at the sessions, and executed in the town. There is a gaol within the borough, which however is only used for the detention of prisoners previous to commitment, the magistrates always availing themselves of the power of committing to the county prison.

The police of the borough is efficient, and consists of a high constable appointed by the corporation, and of others appointed by the inhabitants. The revenues of the corporation are very trifling, the only source of income arising from the tolls of fairs and markets in the town of Much Wenlock.

The town of Much Wenlock consists of only two streets. Between 100 and 200 men in this parish are employed in lime-rock and iron-stone works. In the reign of Richard II. this place is said to have been famous for copper-mines. There are four fairs here in the year. The living is a vicarage, of the net annual value of 180*l.* There are four day-schools; one of them is wholly supported by Lady Wenlock, and another is partly endowed.

Whitchurch is in the hundred of North Bradford, and on the borders of Cheshire, into which county a portion of the parish extends. The population of the entire parish, which comprises twelve townships, in 1831, was 5819. The town is situated on an acclivity, at the top of which stands the church, a handsome structure, erected in 1722. It appears that part of the wall of Whitchurch castle was standing in 1760. The road from Shrewsbury to Chester passes through this place. A weekly market and four annual fairs are held here. The living is a rectory, united with the rectory of Marbury in Cheshire, of the net annual value of 1458*l.* There is one infant-school; seventeen day-schools, one of them a free grammar-school endowed by John Talbot in the reign of Edward VI., and subsequently augmented; one a national school supported by subscription, two others partly supported by subscription, and two day and boarding schools; three day and Sunday schools, one supported by endowment, and to which a lending library is attached, and another partly supported by subscription, and both appertaining to Unitarians. The third is a Lancasterian school. Besides these there are six Sunday-schools supported by contributions. There is an almshouse for six poor persons endowed by the wills of Mr. Samuel Higginson and Jane his widow. Nicholas Barnard, chaplain to Archbishop Usher, and afterwards dean of Ardagh, and the author of several works, was born and buried here. Abraham Whelock, professor of Arabic at Cambridge, and distinguished as a linguist, was also born here.

The principal villages of Shropshire are: Chirbury, Dawley, Donnington, Edgmond, Ercall, Hodnet, Lilleshall, Pontesbury, Prees, Tonge, Westbury, Whittington, Worthen, Wrockwardine, Wroxeter, &c.

Divisions for Ecclesiastical and Legal Purposes.—Shropshire is in the several dioceses of Hereford, Lichfield, and St. Asaph; and the detached portion of the county, comprising the Hales-Owen division of the hundred of Brimstrey, is situated within the diocese of Worcester. The ecclesiastical commissioners however have recommended that the whole of the county which is not comprised within the diocese of Hereford be added to the diocese of Chester. The whole of the county is in the province of Canterbury. The archdeaconry of Salop, in the diocese of Hereford, comprehends the whole (with the exception of one parish, which is in the archdeaconry of Hereford) of that part of Shropshire which is in the diocese of Hereford, forming about one-half of the county. It also includes portions of several adjoining counties. The archdeaconry of Salop, in the diocese of Lichfield, is principally confined within the limits of this county, and includes nearly the whole of that portion of this diocese, the exception being three parishes and a chapelry lying in the archdeaconry of Stafford. The part of the county in the diocese of St. Asaph is included in the archdeaconry of the same name. The deaneries are as follows:—Burford, Clun, Ludlow, Pontesbury, Stottesden, and Wenlock, in the archdeaconry of Salop in the diocese of Hereford; Newport and Salop in the archdeaconry of Salop in the diocese of Lichfield; Lapley and Treizull in the archdeaconry of Stafford, and Marchia in that of St. Asaph. The deanery of Bridgnorth is a peculiar, which the ecclesiastical commissioners have recommended to be added to the diocese of Hereford.

Shropshire contains 220 parishes, of which 9 are in the diocese of St. Asaph, 106 in Hereford, 104 in Lichfield, and 1 in Worcester. The total number of churches and chapels in the county is 224.

Shropshire is included in the Oxford circuit. The assizes and quarter-sessions are held at Shrewsbury, where the county gaol stands. The peculiar jurisdiction of the franchise of Wenlock is noticed elsewhere.

Shropshire returns twelve members to parliament, of which four are for the county, viz. two for the northern division and two for the southern. This division was directed by the Reform Act, and effected by the subsequent Act 2 & 3 Wm. IV., c. 64. The northern division includes the hundreds of Oswestry, Pimhill, North Bradford and South Bradford, and the liberty of Shrewsbury. The southern division includes the hundreds of Brimstrey, Chirbury, Condover, Ford, Munslow, Overs, Purslow (including Clun and Stottesden), and the franchise of Wenlock. The election for the northern division is held at Shrewsbury, and for the southern division at Church Stretton. The polling-places for the northern division are, Shrewsbury, Oswestry, Whitchurch, and Wellington, to which were subsequently added Ellesmere, Newport, Market-Drayton, and Wem. Those for the southern division are, Church Stretton, Bridgnorth, Ludlow, Bishop's Castle, and Wenlock, to which have also been added Cleobury-Mortimer, Clun, Pontesbury, and Shiffnal. The insulated portion of Shropshire at Hales Owen is, for all election purposes, annexed to the eastern division of the county of Worcester. The parliamentary boroughs within the county are Shrewsbury, Bridgnorth, Ludlow, and Wenlock, each of which returns two members to parliament.

The alterations effected by the Reform Act were the addition of two members for the county, and the disfranchisement of the borough of Bishop's Castle, which previously returned two members,—so that the total number of members for the county and boroughs remains the same, viz. twelve.

History, Antiquities, &c.—Previous to the Roman invasion, the district of which this county is now a part was inhabited by the Cornavii and the Ordovices, their territory being divided by the Severn. The boundaries between these tribes and the Silures is uncertain, and it is probable that the southern portion of Shropshire was possessed by the latter; but, as is observed by a modern writer, the only definite memorials of the earlier Britons are their graves.

The Ordovices joined with the Silures under Caractacus in defending their country against the Romans, and were for a time successful. After the subjugation of Britain this county formed part of the Roman province of Flavia Cæsariensis.

The western side of the county bears numerous traces of this remote period. There are remains of various British camps. The name of Caractacus is associated with one situated near Church Stretton, and called Caer Caradoc. The Gaer ditches near Clun, which bear traces of an antient fortification, have been assigned by Camden and others as the spot where the British chief encountered Ostorius Scapula, and was vanquished. This spot corresponds in many particulars with the description given by Tacitus. Coxwall Knoll, on the banks of the river Teme, on the borders of Herefordshire, but within the boundaries of Shropshire, has also been claimed by some antiquarians as the scene of this action, while others urge the claims of the Breidden Hills, near the Severn, to this distinction. As however the description given by Tacitus is the only guide in assisting tradition, the fact cannot be determined with certainty.

On a hill called Tongley, near Walcot, the seat of the earl of Powis, there are vestiges of a British encampment called Bury Ditches. The area is circular and of great extent, defended by three deep trenches. Other British remains may be traced at Brocard's Castle, near Church Stretton; at Old Port (a corruption of Old Fort), near Oswestry; and on the Wrekin and Clee Hills.

Of Roman stations, one of the principal was Uriconium or Viriconium, now Wroxeter, situated on the banks of the Severn, about six miles south-east from Shrewsbury, and although now only a village, there is little doubt that it was a principal city of the Cornavii, and subsequently possessed and fortified by the Romans. A rampart and ditch, with remains of walls, three miles in circumference, mark the antient boundaries of the city. It has long been remarkable for the numerous British and Roman antiquities discovered in the town and neighbourhood. Numerous Roman silver and copper coins have been found here. In 1752 three sepulchral stones bearing inscriptions were found, and numerous urns, as well as entire human skeletons, moulds for forging Roman money, &c. have been from time to time dug up. At the bottom of the Severn at low water foundations of stone may be seen. Another Roman station was Mediolanum, supposed by some to have been near Market-Drayton, but placed by others at Meivod, and a third was Rutunium, at Rowton, although Horsley supposes the site to be at Wem. There were also Bravinium at Rushbury; Sariconium at Bury Hill; and Uricona at Sheriff-Hales. Near the village of Chesterton, in the neighbourhood of Bridgnorth, there are the remains of a Roman camp called the Walls: the form is nearly square, and comprises upwards of twenty acres: it had four entrances to it.

The Roman road known as Watling Street traversed the county from east to south-west, as far as Church Stretton, whence it took a more southerly course, and crossed the Onny at Stretford bridge, and entered Herefordshire at the village of Leintwardine.

As the Roman empire declined, and the Saxons took their place, this country was naturally the scene of numerous battles and contests between the British and Roman inhabitants and the new invaders. The Saxons destroyed the Roman towns; and Uriconium among the rest. The Saxons however soon built another city in its place, to which they gave the name of Scrobbes-burg, the 'town of shrubs' (from the wooded appearance of the neighbourhood), now softened to Shrewsbury. These contests lasted for nearly a century and a half, when the Saxons ultimately succeeded in subduing the inland Britons.

The district thus occupied by the Saxon chiefs extended as far as the base of the Welsh mountains, and became one extensive Saxon state, known by the name of Myrcna-land, or Myrcna-rice, 'the land or kingdom of the borderers,' Latinized into Mercia, and subsequently corrupted into the Marches of Wales. The portion of this district now comprising the counties of Salop and Hereford was possessed at first by a tribe of Saxons named Hecanas; but in the year 626 Penda obtained the supreme power over the whole of Mercia, and during the seventh and eighth centuries the Saxons held firm possession of the county, and were sometimes assisted by the independent Welsh in the contests with other Saxon kings. The Welsh princes however began to make inroads on the Saxons, and many battles took place between them.

In consequence of these attacks Offa, king of Mercia, formed that dyke or rampart which still bears his name, extending from Flintshire on the north to the Bristol Channel on the south, and which seems to have been intended as a defence as well as a boundary between the Saxons and the Britons. It entered Shropshire between Chirk and Oswestry, crossed part of Montgomeryshire, and again entered Shropshire between Newtown and Bishop's Castle, finally quitting it and entering Radnorshire at Knighton, on the banks of the Teme. It may be still plainly traced on the high ground where cultivation and the ploughshare have not levelled it. This work did not answer the purposes for which it was intended; for the Welsh penetrated far east of it, and committed great ravages, carrying away immense spoil in their retreats.

This part of the kingdom of Mercia, in common with the rest of England, was affected by the incursions of the Danes in the latter part of the ninth century. In 849 they penetrated as far as the Severn, and in the following year reached Wales. In 896 they established themselves at Cwatbricge (Quatford) on the Severn, south of Bridgnorth, where they built a fortress and passed the winter. At Cleobury-Mortimer are the remains of what is supposed to have been a Danish camp.

When Alfred succeeded in subduing the Danes, and uniting the seven Saxon kingdoms into one, Scrobbesburg was one of his principal cities, and he gave the same name to the shire of which it is the capital. His daughter Ethelfleda, in 912, built a fortress at Bridgnorth, and another in 915 at Cyricbyrig, or Chirbury, as defences against the Danes, who, towards the end of that century, again became formidable; and while they ravaged the south, Ethelred was living in indolence on one of his manors in Shropshire. The Welsh however still continued to dispute the boundaries, and Griffydd, prince of North Wales, carried his incursions so far as to induce Harold to march against him. Harold succeeded in discomfiting the mountaineers, who sent him the head of their prince as a peace-offering; and there is a tradition that the heaps of rock called by the Britons *Carneddau tewion*, on the summit of the Stiperstones, on the western side of this county, are monuments of the triumph of Harold.

The Norman conquest produced a greater change in the state of this county and the Welsh borders than perhaps any of the previous transitions of empire; for William the Conqueror, as soon as he was established on the throne, granted nearly the whole of this district, as well as other lands, to his relative Roger de Montgomery, who had assisted him in subduing Edric Sylvaticus, earl of Shrewsbury. The king also granted to many of his followers all the lands they might conquer from the Welsh; and as this was naturally an incentive to aggressions of greater force than any sense of duty or allegiance to their monarch, it may be readily imagined that a bitter and exterminating warfare was carried on against the antient possessors of the soil. The Welsh did not tamely submit to their encroachments; and in 1068 or 1069, under Owen Gwinnedd, their prince, and Edric the Forrester, the dispossessed Earl of Shrewsbury, they assaulted the city of Shrewsbury with such vigour and in such numbers as to require the whole Norman army and William at its head, who had lately returned from Normandy, to drive them back. Edric, although the last to yield, obtained forgiveness, and was afterwards raised to trust and favour. The allegiance of the Welsh was also attempted to be gained by promising a confirmation of all their privileges upon paying a small sum or other token in acknowledgment of the right of the English crown, and by threatening them in case of refusal. In these grants of the Conqueror to his Norman barons may probably be traced the origin of the Lords Marchers, who for a long period held as arbitrary and despotic sway over the inhabitants of the border country as the monarch himself in other parts. They were however bound to assist the king in his wars, and to maintain their castles well armed and garrisoned for the defence of his as well as their own territories. Their jurisdiction within their respective seignories may be said to have been unbounded. They established a court of their own to settle disputes among themselves. They built towns and erected castles, and to them may be attributed the greater portion of the numerous castles in this county, a number exceeding, says an old writer, that of any other district.

On the death of the Conqueror, Roger de Montgomery and the border barons espoused the cause of Duke Robert, and with their dependants and Welsh auxiliaries ravaged Worcestershire and Shropshire, but the insurrection was soon repressed by William II., the early years of whose reign were marked by constant hostilities between the Welsh and the border barons, and the former, encouraged by the death of Roger de Montgomery in 1094, invaded Shropshire and Herefordshire in that and the following years, destroying castles and carrying away plunder. The king proceeded with a large army to stop their depredations, and although unable to bring the Welsh to a regular engagement, he eventually succeeded in subduing them.

Upon the death of William II., Robert de Belesme, to whom the earldom of Shrewsbury had descended, espoused the claims of Robert, duke of Normandy, in opposition to those of Prince Henry; and in 1102, when the latter was established on the throne, he broke out into open rebellion, and fortified his castles of Shrewsbury and Bridgnorth in this county. The king declared him a traitor, and marched against him with a considerable force. Bridgnorth surrendered to Henry after a siege of thirty days, the king having in the mean time been joined by three thousand of the knights and landholders of Shropshire, who were weary of the tyranny of their feudal lord; and upon the latter presenting himself before the gates of Shrewsbury, the inhabitants sent him the key of the town, and the earl, forced to surrender, was banished to Normandy. He subsequently took arms a second time against Henry, and being taken, remained a prisoner for the rest of his life. In the wars between Stephen and the empress Maude, William Fitz-Alan, governor of Shrewsbury, and sheriff of the county, in common with several noblemen, espoused the cause of the empress. Stephen besieged the castles of Shrewsbury and Ludlow, and upon taking the former, hanged several of the garrison. Fitz-Alan fled; but upon the accession of Henry II. he was restored to his estates. Henry destroyed an immense number of castles, and among the rest that of Bridgnorth. In the reign of John, Gwynwynwyn, Prince of Powys, came to Shrewsbury to meet the English council assembled there to decide upon the measures necessary to be adopted to counteract and oppose the depredations of the Welsh on the borders. The English council however, by a gross breach of confidence and generosity, refused to listen to his proposals, and detained him as a prisoner.

In 1215 Llewellyn, Prince of Wales, marched to Shrewsbury with a large force, upon which the town and castle were delivered to him without resistance. In a short time after Henry III. came to the throne, Shrewsbury was again in the hands of the English, and an amicable understanding subsisted for some time between Henry and the Welsh. In 1233 however new feuds broke out. The Earl of Pembroke and his associates fled into Wales and joined Llewellyn, and with their united forces they laid waste the marches, sacked Shrewsbury, and put the inhabitants to the sword. The king adopted a mild policy, and effected a treaty with the insurgents; but the Earl of Pembroke being treacherously stabbed, this treaty was not of long duration. Repeated conflicts ensued between Henry and Llewellyn, and his brother David ap Llewellyn, during which Shrewsbury was for a short time in the hands of the English. In 1277, in consequence of these repeated disturbances of the Welsh, Edward I. removed the courts of King's Bench and Exchequer to Shrewsbury, where they were held for some time; and in 1283 the parliament was assembled there, and at Acton Burnell, for the express purpose of adopting measures against David ap Llewellyn, who was taken prisoner, tried by the parliament, and hanged and quartered. With this prince and his brother Llewellyn, who had been previously killed in battle, ended the race of the brave native princes of Wales.

Edward now formed Wales into a principality for his son; and by a parliament held at Rhudlin Castle laws were enacted for the government of the country. In 1397 Richard II. adjourned his parliament from Westminster to Shrewsbury, where it was held with great splendour. The revolt of Owen Glendwr, in the subsequent reign of Henry IV., is so well known, and forms so material a feature in the history of England, as to render anything more than the bare mention of it superfluous. [GLENDWR.] For the same reason it is sufficient merely to allude to the memorable conflict between Henry and the Percies, known as the battle of Shrewsbury, which took place on the 22nd of July, 1403, at Berwick, near Shrewsbury, and established Henry on the throne.

In the contests between the houses of York and Lancaster, Shrewsbury, Ludlow, and the border country in general espoused the cause of the former; and it was perhaps in gratitude for these services that Edward IV. re-established the court of the resident and council of the marches of North Wales, which was held at Ludlow; and this court, although altered and affected by subsequent acts, continued until the reign of William III., when it was abolished by act of parliament, at the request of the inhabitants of the principality. It seems difficult to determine whether the marches comprehended in Shropshire were under the jurisdiction of this court; for subsequently, by the 27th of Henry VIII., some marches were annexed to Wales and others to England; and by the statute which established the court of the marches, this, with other counties, was excluded from its jurisdiction. After the usurpation of the throne by Richard III., the duke of Buckingham, his former ally, endeavoured to raise an insurrection in this district against the tyrant; but meeting with disasters which dispersed his army, he fled to Shrewsbury, where he was betrayed and executed without trial. The Duke of Richmond, afterwards Henry VII., having assembled his army on the Long Mountain on the borders of this county, marched to Shrewsbury, where, after some hesitation on the part of the bailiff, he was enthusiastically received by the inhabitants, and was joined by the tenants of the earl of Shrewsbury, who accompanied him to Bosworth Field.

The marches of Wales annexed to Shropshire by the 27th of Henry VIII. were 'the lordships, towns, parishes, commotes, hundreds, and cantredes of Oswestrie, Whetington, Masbroke, Knocking, Ellesmere, Down, and Cherbury hundred.' Of these, Oswestry, Whittington, Masbrook, and Knocking were formed into the hundred of Oswestry. Ellesmere, *cum membris*, was united to the hundred of Chirbury; and by a subsequent statute, passed in the same reign, the town and hundred of Aberton, until then included in Merionethshire, was added to this county.

In the great civil war between Charles I. and the Parliament, the towns of Shrewsbury, Ludlow, and Bridgnorth espoused the royal cause. In 1642 Charles came to Shrewsbury from Nottingham at the head of his army. He was joined here by Prince Rupert, Prince Charles, the Duke of York, and many noblemen and gentlemen of the adjoining counties, and his army considerably reinforced. He left the town on the 12th of October, and marched towards London. The battle of Edge-hill took place on the 23rd of the same month. In 1644 the town was stormed by the parliamentary forces, and soon taken, the guards having deserted their posts. Bridgnorth was besieged by the parliamentary forces, and the castle, after standing out for a month, was taken.

The great number of castles built in the western side of the county has been already remarked. The most important of these existing in the beginning of the reign of Henry III. appear to have been Bruges (Bridgnorth), Salopesbury (Shrewsbury), Ludelaue (Ludlow), Ellesmere, Caus, and Blancmuster (or Oswestry). Of these, Bridgnorth and Shrewsbury were originally Saxon fortresses.

Among those whose ruins still remain, Ludlow was one of the most extensive, and its ruins are perhaps the most perfect, on the whole Welsh border. It is generally supposed to have been founded by Roger de Montgomery, who has been already mentioned, and held by his descendant Robert de Belesme, from whom it was taken by Henry I., and granted to his favourite Joce de Dinan, who completed the building. In the next reign it was besieged by Stephen, the castle having been previously seized by Gervase Paganel, who joined the empress Matilda; but as it was manfully defended, the king was obliged to raise the siege. It however subsequently fell into the king's hands, and Henry II. gave the castle and the valley called Corve-dale to Fulke Fitzwarine, surnamed De Dinan, who was succeeded by Joceas de Dinan, who seized and confined Hugh de Mortimer, lord of Wigmore, in one of the towers of the castle, which still bears his name. In the reign of Richard I. the castle was seized by Hubert, archbishop of Canterbury, on behalf of the crown. King John presented it to Philip d'Aubigney, from whom it eventually passed to the Mortimers, and from them hereditarily to the crown. In the reign of Henry VI. it was possessed by Richard, duke of York, who had raised forces in the Welsh marches. On the advance of the king's army however, in 1459, the duke and his sons abandoned the castle and town, which were given up to plunder. It is said that the duchess of York, with her sons, and the duchess of Buckingham, were confined as prisoners here a considerable time.

In the progress of the civil war the castle came into the possession of Edward, duke of York, who, on his accession to the throne as Edward IV., repaired the castle, and made it the court of his son the prince of Wales. The latter, on the death of his father, was here proclaimed king, and shortly afterwards removed to London by his uncle the duke of Gloucester. In the reign of Henry VII. this castle again became a royal residence; and Arthur, the king's eldest son, held a court here to celebrate his marriage with Katharine of Aragon. The prince died here the following year. The most splendid æra of Ludlow Castle was subsequent to this period. During the reigns of Henry VIII. and Elizabeth, the lords-presidents of the marches had their courts here. Sir Henry Sidney, who held the office of president, made this castle his favourite residence, and put it into repair. In 1616 it was visited by Prince Charles, afterwards Charles I. The masque of 'Comus' was performed here in 1634, during the presidency of the earl of Bridgewater. During the civil wars in the reign of Charles I. this castle was for some time kept as a garrison for the king; but in June, 1646, it was delivered up to the parliamentary forces. After the Restoration, Butler, who was secretary to the earl of Carbery, the president of the marches, wrote a part of his 'Hudibras' in the castle. After the dissolution of the court of the lords-marchers, in the reign of William III., the castle was suffered to fall into decay, and it is now a magnificent ruin.

The ruins of Shrewsbury Castle are slight, and are noticed under that article. [SHREWSBURY.]

Of Bridgnorth Castle (which is also noticed under BRIDGNORTH), only one tower remains. The castle is said to have been founded as far back as the year 912.

The castle of Oswestry has also been noticed in describing the town. [OSWESTRY.]

Acton Burnell Castle, near Longnor, was founded or restored by Robert Burnell, bishop of Bath and Wells, treasurer and afterwards chancellor of England. This castle is remarkable as being the place where a parliament was held in 1284, in the reign of Edward I. The lords sat in the castle, and the commons in a large barn belonging to the abbot of the monastery of St. Peter and St. Paul at Shrewsbury. The act entitled Statutum de Mercatoribus was passed here. The remains of the castle consist of a square building, with a tower at each corner.

Cause Castle, near the village of Westbury, in the hundred of Ford, is supposed to have been erected by Roger Corbett, who held a considerable tract of land in this district under Roger de Montgomery. It subsequently passed into the hands of Henry I., who gave it to Paris Fitz John. It more than once fell into the power of the Welsh, with the lands in the neighbourhood. On the execution of the duke of Buckingham, the last earl of Stafford, in whose hands it had been for some time, it was forfeited to the crown, but was restored to the son of that nobleman. In the reign of Elizabeth it was alienated to Robert Harcourt. It is now a mere confused heap of ruins, a great portion of the stone having been removed. The site of the castle is one of the most lofty and commanding in the western border of this county.

Clun Castle has been described in another part of this article.

Of the early history of Hopton Castle, situated in the south-western side of the county, little appears to be known. It was granted by Henry II. to Walter de Clifford. In the civil wars in the reign of Charles I., it was defended on behalf of the parliament, and the siege lasted upwards of a fortnight. The castle was soon afterwards nearly destroyed, and is now in complete ruin. The castles of Knocking, Ruyton, and Middle, in the hundred of Oswestry, were built by the family of L'Estrange about the twelfth century. The castle of Knockin was destroyed in the civil wars in the reign of King John, but afterwards repaired by John L'Estrange in the reign of Henry III. Scarcely a vestige of the castle now remains, the stone having been carried away and some of it broken up to mend the roads. There are no remains of Ruyton Castle, and those of Middle consist of little else than one tower. Red Castle, near Hawkstone, although stated by Dugdale and others to have had its origin in the reign of Henry III., appears, from an antient manuscript in the Audley family, to have been in existence in the reign of William the Conqueror; and that the lands in its vicinity were given by Maud, the wife of that sovereign, to John de Audley for certain services rendered to the state. The position of the castle is remarkably strong, being the summit of a rocky hill.

Whittington Castle, near Oswestry, was formerly a place of considerable importance, and held after the Conquest by Roger de Montgomery, but being forfeited by his son Robert, it was bestowed on William Peverel, who offered the castle and his fair daughter Melette to that one of the lady's suitors who should prove victorious in a tournament appointed to take place at Peverel's castle in the Peak of Derbyshire. The prize was won by Guarine de Metz, of the house of Lorraine, lord of Alderbury and sheriff of Shropshire, in whose family the castle remained for nearly four centuries; but in 1419, the race becoming extinct, the castle and manor passed through various hands. The adventures of Fulke Fitz-Warine or Guarine, the grandson of Guarine de Metz, are recorded in the Anglo-Norman metrical 'Romance of the Fitz-Warines,' of which a prose version of the fourteenth century is preserved in the British Museum. The ruins are extremely picturesque, and include eight massive towers. The east walls of the castle are washed by a lake.

In addition to the above, there are remains of castles at Alderbury, Sibdon, and Wattlesborough. Bishop's Castle (as the name imports), Chirbury, Ellesmere, Holdgate, and Whitchurch were also seats of castles, but of these no portions now exist.

The ecclesiastical and religious establishments in the county amounted to near fifty. From a manuscript of the earlier part of the reign of Henry III., preserved in the Cotton MSS. in the British Museum, and recently (1841) brought to light by Mr. Thomas Wright, the following appear to have been the most important monastic houses in the county at that period:—

Abbatia Salopesbury (Shrewsbury), S. Petri et S. Melburgæ, Monachi nigri.

Abbatia Beldewas (Buildas), S. Mar., Monachi nigri.

Abbatia Lilleshelle (Lilleshall), Canonici nigri.

Abbatia Hageman (Haughmond), S. Mar., Canonici albi.

Prioratus Wenelok (Wenlock), S. Melburgæ, Monachi nigri de Cluniaco.

Prioratus Brumfield (Bromfield), Monachi nigri.

The remains of some of the abbeys are very beautiful. Buildas Abbey is situated at the village of Buildas, on the south bank of the Severn, about eleven miles below Shrewsbury. It was founded in the year 1135, by Roger, bishop of Chester, for monks of the order of Savigny, which was afterwards united to the Cistercians. The foundation was confirmed by Stephen in 1139, and it was subsequently enriched by many munificent benefactions and donations confirmed by royal charter. Henry II. subjected the abbey of St. Mary's, Dublin, to the abbots of this place. The site and all the lands belonging to the establishment in Shropshire, Staffordshire, and Derbyshire were granted by Henry VIII. in 1538, to Edward, lord Powis. At the time of its dissolution it contained twelve monks. The abbey was dedicated to St. Mary and St. Chad. The walls are nearly entire. The shape of the building is cr
tower in the middle. The chapter-h
feet. It is a parallelogram 43 feet by 33,
the building. The side aisles, transept, and chapels of
choir are in total ruin. The lower story of the tower remains, resting on four arches springing from brackets in the walls. The ruins present some curious specimens of the architecture of the period when the round arch was giving way to the pointed.

Haughmond or Haghmond Abbey is situated on a rising ground four miles east of Shrewsbury. It was founded in 1100 by William Fitz-Alan, who conferred on it the land on which it stood with all appurtenances. Leland says there was a hermitage and a chapel on this spot before the abbey was built. The establishment consisted of canons of St. Augustine, and all grants made to them were confirmed by charter of the 13th Edw. II. Henry II., at the request of the abbot, granted to William Fitz-Alan and his heirs the keeping of the abbey and its possessions in times of vacation occasioned by the death of any abbot, to the exclusion of the king and his successors. Pope Alexander, in 1172, granted many valuable privileges to the abbots and monks of this monastery, which were confirmed by subsequent possessors of the see. The yearly revenues at the dissolution amounted, according to Dugdale, to 259*l.* 13*s.* 7½*d.* The extent of the whole foundation is not distinctly traceable, but the chapter-house is entire. It is oblong, the upper end forming two sides of an hexagon. The roof is of oak, on which rested another story. A beautiful Norman arch in the south door of the nave is all that remains of the abbey church. South of the chapter-house are remains of the refectory, halls, &c.

Lilleshall or Lilleshull Abbey, near the village of the same name, in the neighbourhood of Newport, is an extremely beautiful ruin. It was founded in the reign of Stephen, and endowed with the estates of a college of St. Alkmond, said to have been founded by Ethelfleda, 'the lady of the Mercians.' The church, which was cruciform, was 228 feet in length, and the breadth of the nave 36 feet. It appears to have had two towers, one in the centre and the other at the west end, and the fine round Norman arch at that end appears to have been the lower portion of the latter. The south door communicating with the cloister is one of the richest early Norman arches in the kingdom. The east window is large, with a beautiful pointed arch of the fourteenth century. The abbeys of Shrewsbury and Wenlock are noticed elsewhere. There are also remains of an abbey near Alderbury, called New or White Abbey, founded by Fulke Fitz-Warine, in the early part of the thirteenth century.

At Bromfield, near Ludlow, are the remains of a priory or cell of Benedictines, originally a college of prebends or secular canons, founded in 1105. In 1155 the prior and canons, wishing to become monks, placed themselves under the government of the abbey of St. Peter's of Gloucester, and from that time Bromfield was considered as only a cell to that great monastic foundation. The ruins are slight, but are well situated on the river Teme.

At Chirbury, on the borders of Montgomeryshire, there are also traces of a priory of Austin canons. It was founded in the reign of King John; its nave forms the present parish church. The choir and the transept are totally destroyed.

White Ladies' priory is near Boscobel, on the borders of Staffordshire. It is a picturesque ruin, situated in a sequestered spot. The date of its foundation is uncertain, but its architecture indicates Saxon origin. It was inhabited by White or Cistercian nuns as early as the reign of Richard I. or John.

At the village of Tonge there is an antient collegiate church, formerly belonging to the abbey of Shrewsbury, purchased by Isabel, widow of Sir Fulke Pembridge, in the early part of the fifteenth century, who rebuilt it, and made it collegiate for a warden, four fellows, two clerks, and choristers; to which was added an hospital for thirteen poor persons.

The Heath chapel, situate at the north foot of the Brown Clee Hills, is a curious specimen of Anglo-Norman architecture in its simplest form.

Stoke Castle, near the village of Onibury, in the hundred of Munslow, is a relic of the castellated mansion of past ages, rather than of a post of strength.

Boscobel House, situate near the village of Tonge, on the borders of Staffordshire, was a place of concealment for Charles II. after his defeat at Worcester. The battle was fought on the 3rd of September, 1651, and at the close of the engagement Charles fled, accompanied by the duke of Buckingham, the earl of Derby, Lord Wilmot, and other adherents, under the guidance of Charles Gifford, Esq., a Staffordshire gentleman, and Francis Yates, one of his servants. The party arrived on the morning of the 4th of September at White Ladies', about three-quarters of a mile from Boscobel, and inhabited by John Penderell and his brothers. Here the king put on the dress of a woodman, and spent the day in the adjoining woods, his followers having left him and joined the disordered royalist troops, with the exception of Lord Wilmot, who went in another direction. That night the king, accompanied by Richard Penderell, proceeded on foot to Madeley, to the house of Mr. Francis Wolfe, intending to proceed into Wales, but finding the country was overrun with the militia and soldiers of the parliamentary forces, they lay concealed in a barn of Mr. Wolfe's the whole of that day. As soon as it was dark, the king determined to retrace his steps, and, accompanied by Richard Penderell, they forded the Severn, and walked all night to Boscobel, which was inhabited by William Penderell and his wife. Here he met with Major Careless. The following day was spent in an oak-tree near Boscobel, and that and the night succeeding Charles appears to have slept at Boscobel. On Monday, the 8th of September, near midnight, he set off on horseback again, accompanied by Richard Penderell, to Broseley, the residence of Mr. Whitgrave, where he met Lord Wilmot. From Mr. Whitgrave's the king went the next night to Col. Lane's, at Bentley, with whose sister, Mrs. Lane, he subsequently made his escape on horseback into the south.

(Archdeacon Plymley's *Survey of Shropshire*; *Beauties of England and Wales*; Dugdale's *Monasticon*; Gough's *Camden*; Wright's *History of the Welsh Border*; Murchison's *Silurian System*; together with various Parliamentary Reports and Returns, &c.)

STATISTICS.

Population.—Shropshire ranks the nineteenth on the list of agricultural counties. In 1811, the proportion of the agricultural population was 42 per cent.; in 1821, 44 per cent.; and in 1831, 36·8 per cent. In 1831, of 56,754 males twenty years of age and upwards, 23,267 were employed in agriculture, comprising 17,296 labourers, 3832 occupiers of land employing labourers, and 2139 small occupiers not employing hired labour. The number of males aged twenty employed in manufactures, or in making manufacturing machinery, was 1353 in 1831. 'The preparation of iron for the forge is the principal manufacture in the county of Salop; at Hales-Owen nearly 500 men are so employed, and at Madeley 250. At Dawley and other places in its vicinity many men are employed in the blast furnaces, but the number is not mentioned. At and near Shrewsbury 74 men are employed in iron castings and at forges, and in preparing the weighty apparatus of powerful machinery; nails are made at Wellington. The finer kinds of earthenware employ about 200 men at Madeley and Broseley; carpeting employs 90 men at Bridgnorth; glass is made at Wrockwardine; flannels are made at Oswestry, Church-Stretton, and Worthen; and a small manufacture of hair-seating exists at (Market Drayton) Drayton-in-Hales.'—(*Census of* 1831.)

The population of Shropshire, at each of the four following periods was,—

	Males.	Females.	Total.	Increase per cent.
1801	82,563	85,076	167,639	. .
1811	95,842	98,456	194,298	15·8
1821	102,056	104,097	206,153	6·1
1831	111,017	111,921	222,938	8·1

showing an increase of 55,299 in thirty years, or 32·9 per cent.; being about 3½ per cent. below the whole rate of increase throughout England.

The following table exhibits a summary of the population of every hundred, &c. as taken in 1831:—

HUNDREDS, BOROUGHS, &c.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of persons.	Males twenty years of age.
Bradford, North (Hundred)	5,131	5,438	21	126	2,751	1,636	1,051	13,149	13,718	26,867	6,3[illegible]
Bradford, South ,,	7,301	8,028	26	201	1,819	4,575	1,634	19,208	18,774	37,982	9,6[illegible]
Brimstrey ,,	4,087	4,734	44	187	1,520	1,861	1,353	10,544	10,521	21,065	4,6[illegible]
Chirbury ,,	749	850	7	17	444	148	258	2,218	1,994	4,212	1,04[illegible]
Condover ,,	1,061	1,153	2	29	743	239	171	3,051	2,859	5,910	1,6[illegible]
Ford ,,	1,291	1,412	1	50	664	282	466	3,517	3,381	6,898	1,7[illegible]
Munslow ,,	1,949	2,075	15	31	1,395	426	254	5,277	5,090	10,367	2,7[illegible]
Oswestry ,,	3,610	3,868	14	103	1,890	1,132	846	9,351	9,674	19,025	4,8[illegible]
Overs ,,	533	560	2	16	327	99	134	1,407	1,360	2,767	7[illegible]
Pimhill ,,	2,209	2,325	8	19	1,215	638	472	6,207	6,108	12,315	3,4[illegible]
Purslow ,,	2,266	2,428	10	55	1,520	535	373	6,181	5,952	12,133	3,1[illegible]
Stottesden ,,	2,290	2,420	6	111	1,352	522	546	6,059	5,860	11,919	3,2[illegible]
Bridgnorth (Borough)	1,113	1,262	8	44	56	100	1,106	2,555	2,743	5,298	1,3[illegible]
Ludlow ,,	909	1,119	10	56	—	490	629	2,428	2,825	5,253	1,3[illegible]
Shrewsbury (Borough and Liberty)	4,492	4,957	48	184	721	1,944	2,292	11,107	12,385	23,492	6,0[illegible]
Wenlock (Town and Liberties)	3,642	3,798	31	186	679	1,583	1,536	8,758	8,677	17,435	4,3[illegible]
Total .	42,633	46,427	253	1,415	17,096	16,210	13,121	111,017	111,921	222,938	56,[illegible]

County Expenses, Crime, &c.—Sums expended for the relief of the poor:—1748-49-50 (annual average), 7925*l.*; 1776, 22,316*l.*; 1783-84-85 (average), 33,937*l.* The sums expended at the four dates of—

		£.		s.	d.	
1801	were	66,747,	being	7	11	for each inhabitant.
1811	. .	106,318	,,	10	11	,,
1821	. .	92,907	,,	9	0	,,
1831	. .	87,111	,,	7	9	,,

The expenditure in each of the following years was as under:—

1835.	1836.	1837.	1838.	1839.	1840.
£73,039	£64,003	£56,351	£51,506	£54,778	£55,[illegible]

Assuming that the population had increased from 18[illegible] to 1840 at the rate of one per cent. per annum, the expenditure in the latter year would average 4*s.* 6½*d.* for each inhabitant, which is lower than for the whole of England and Wales. The saving effected between the years 1834 and 1840 amounted to 34,406*l.*, or 37 per cent., namely, under the head of relief and maintenance, 27,471*l.*, or 33 per cent.; in suits of law, &c., 2839*l.*, or 71 per cent.; and in miscellaneous expenses, 4046*l.*, or 56 per cent.

In 1835-6 the number of bastard children chargeable to the poor-rate in the county was 2037, or 1 in 109 of the population according to the census of 1831, the proportion for England being 1 in 215. In 1830 the number of illegitimate births was 495, or 1 in 13, the proportion for England being 1 in 20. The number of lunatics and idiots chargeable on the poor's-rate in 1836 was 261, or 1 in 854, the proportion for England being 1 in 1033. The number of paupers relieved during the quarter ending Lady-day, 1840, was 10,396 (1924 in-door, and 8472 out-door), being 6 per cent. of the total population, which, with the exception of Derbyshire and Staffordshire, was lower than in any county in England or Wales. The number of poor-law unions in the county is 13, comprising a population of 174,899, according to the census of 1831. There are 22 parishes, containing a population of 48,039, in which the administration of relief to the poor is managed under local acts.

The annual value of real property in the county assessed to the property tax in 1815 was 1,037,988*l*. The sum raised for poor-rate, county-rate, and other local purposes, in the year ending 25th March, 1833, was 106,285*l*., and was levied upon the various descriptions of property as follows:—

On land . .	£86,035	13*s*.
Dwelling-houses .	14,202	8
Mills, factories, &c. .	1,900	11
Manorial profits, navigation, &c.	4,146	17
Total	£106,285	9

The amount expended was—

For the relief of the poor . .	£86,077	3*s*.
In suits of law, removal of paupers, &c.	3,803	11
For other purposes . .	19,405	19
Total money expended	£109,286	13

The county expenditure in 1834, exclusive of that for the relief of the poor, was 9880*l*. 10*s*. 11*d*., disbursed as follows:—

	£.	*s*.	*d*.
Bridges, building, repairs .	1,241	15	11
Gaols, houses of correction, and maintaining prisoners, &c. .	3,426	2	8
Shire-halls and courts of justice, building, repairs, &c.	427	2	9
Lunatic asylums	34	15	0
Prosecutions . . .	1,865	9	1
Clerk of the peace . .	999	15	9
Conveyance of prisoners before trial	377	16	9
Conveyance of transports .	137	18	10
Vagrants, apprehending and conveying	6	18	4
Constables, high and special .	18	16	9
Coroner	286	1	6
Debt, payment of interest and principal	101	5	6
Miscellaneous . . .	956	12	1
Total	£9,880	10	11

The county-rate raised at different periods during the last half century, and the principal disbursements, are shown in the following table:—

	1792. £	1801. £	1811. £	1821. £	1831. £	1838. £
Income .	4,453	8,322	8,616	10,945	10,126	14,979
Expenditure:—						
Bridges .	1,254	1,363	3,203	950	2,617	1,682
Gaols .	26	142	501	1,051	556	1,498
Prisoners' maintenance	848	2,430	1,917	2,911	3,788	2,190
Prosecutions	102	786	368	1,736	2,169	2,626
Constables & vagrants	393	550	167	528	237	313

According to official returns (made pursuant to act 2 & 3 Vict., c. 40), the length of streets and highways in the county, and the expenditure thereon, in 1839, was as under:—

	Miles.
Streets and roads repaired under local acts	49
Turnpike-roads	640
All other highways	2,245
	2,935

Amount of rates levied . . .		£15,534
Expended in repairs of highways	£14,872	
Law and other expenses . .	101	
Total expenditure .		£14,973

In 1839 there were 39 turnpik number of miles of road under the 1839 the income arising from tolls wa composition in lieu of statute duty, 219*l*.; estimated of statute duty performed, 352*l*.; total income, 27,548*l*.; and the total expenditure in the same year was 30,143*l*. The assets, including arrears of income, amounted to 7836*l*.; the debts to 129,183*l*. The debts, in 1836, were equal to 3·41 years of the annual income; the proportion of unpaid interest to the total debt was only 3 per cent., the average for England being 12 per cent.

In 1839 the sum of 9446*l*. was collected to defray expenses connected with the Established Church, of which sum 7537*l*. was derived from church-rates, and 1909*l*. from various other sources, including 440*l*. from estates and rent-charges. The expenditure amounted to 8595*l*., and included 3385*l*. for repairs of churches.

Crime.—Number of persons charged with criminal offences in the four septennial periods ending 1819, 1826, 1833, 1840:—

	1815-19.	1820-26.	1827-33.	1834-40.
Total of each septennial period . .	986	1013	1509	1917
Annual average .	141	144	215	274

The numbers committed, convicted, and acquitted in each year from 1834 to 1840 were as under:—

	1834.	1835.	1836.	1837.	1838.	1839.	1840.
Committed	263	206	228	252	271	310	387
Convicted	204	130	147	180	195	217	259
Acquitted	59	76	81	72	76	93	128

In 1834 the proportion of persons committed to the total population of the county was 1 in 848; in 1837, 1 in 884; and in 1840 (allowing 1 per cent. per annum for the increase of population), 1 in about 620.

Of 387 criminal offenders tried at the assizes and sessions in Salop in 1840, 18 were charged with offences against the person; 22 with offences against property committed with violence; 308 (including 244 cases of simple larceny) with offences against property committed without violence; only 1 was charged with malicious offences; 4 for forging and uttering base coin; and 34 for various misdemeanours. Of the whole number committed, 259 were convicted, 128 were acquitted, 3 were not prosecuted, no bill was found against 45, and 80 were found not guilty on trial. Of those convicted there was not one case in which sentence of death was passed. Of 12 convicted of offences against the person, 7 were sentenced to various terms of imprisonment (5 to periods of six months and under), and 5 were either whipped, fined, or discharged on sureties. In 20 convictions for offences against property committed with violence, 2 were transported for life; 2 for terms above 10 and not exceeding 15 years; 7 for terms exceeding 7 and under 10 years; 8 were imprisoned for terms above 6 months and not exceeding 1 year. In 191 convictions for offences against property committed without violence, 2 were transported, 13 for periods exceeding 7 years, and 17 for 7 years; 3 were sentenced to imprisonment for 1 year and upwards; 22 for 1 year and not under 6 months; and 134 for periods under 6 months. In the single case of malicious injury to property, the offender was sentenced to transportation for 10 years. In 3 convictions for uttering base coin, the offenders were sentenced to short periods of imprisonment not exceeding 6 months. In 32 convictions for misdemeanours, 14 were sentenced to various terms of imprisonment (only 1 for above 12 months), and 18 were discharged on fines or sureties. The number sentenced to transportation was 43 males and 1 female. Of the whole number of offenders tried, 315 were males and 72 females; 138 males and 38 females could neither read nor write; 144 males and 30 females could either read or read and write imperfectly; 12 males could read and write well: 2 males had superior instruction; and the degree of instruction of the remaining 19 males and 4 females could not be ascertained. The proportion of uninstructed criminals on an average of several years was 94·7 per cent., and of those instructed 5·3 per cent., the average of the former for England and Wales being 89·3 per cent.

Savings' Banks.—There are 13 savings' banks in the county, in which the number of depositors and amount of deposits on the 20th of November, in each of the following years, were as under:—

	1832.	1833.	1835.	1836.	1837.	1838.
No. of depositors	9,952	10,276	11,535	12,200	12,664	13,330
Am. of depots.	£374,378	£392,034	£412,035	£435,665	£450,171	£473,637

The various sums placed in the savings' banks in 1830, 1834, and 1839, were distributed as under:—

		1830.		1834.		1839.	
		Depositors.	Deposits.	Depositors.	Deposits.	Depositors.	Deposits.
Not exceeding	£20	4,434	£32,368	5,183	£38,603	6,753	£51,786
,,	50	2,504	77,632	2,981	99,218	4,000	123,563
,,	100	1,824	90,568	1,399	96,864	1,829	126,093
,,	150	572	67,963	562	67,845	672	80,355
,,	200	252	42,875	292	49,438	466	77,595
Above . .	200	148	36,940	127	32,168	116	28,158
		9,234	347,796	10,544	377,126	13,836	487,550

Exclusive of the above, the deposits of 132 friendly societies amounted, in 1839, to 30,553*l.*; and 14,078*l.* were invested by 165 charitable institutions.

The number of registered parliamentary electors in the county, in 1835, was,—northern division, 5016; southern, 3566: total, 8682. In 1840 there was an increase of 23 in the northern division, and of 210 in the southern division; the total number in the county being 8815, classed as follows:—

	N. div.	S. div.	Total.
Freeholders of every class . .	3,309	2,227	5,536
Copyhold and customary tenants	115	87	202
Leaseholders for life or period of years	23	50	73
50*l.* tenants at will	1,462	1,313	2,775
Trustees and mortgagees in actual receipt	14	4	18
Qualified by offices	72	87	159
Joint and duplicate qualifications	44	8	52
	5,039	3,776	8,280

Education.—The following summary is taken from the Parliamentary Returns made in 1833:—

	Schools.	Scholars.	Total.
Infant schools . . .	28		
Number of children at such schools; ages from 2 to 7 years:—			
Males . .		305	
Females . .		362	
Sex not specified .		286	
			953
Daily schools . . .	542		
Number of children at such schools; ages from 4 to 14 years:—			
Males . .		7,954	
Females . .		6,333	
Sex not specified .		3,939	
			18,226
Schools . .	570		
Total of children under daily instruction			19,179
Sunday schools . . .	240		
Number of children at such schools; ages from 4 to 15 years:—			
Males . .		7,185	
Females . .		7,158	
Sex not specified .		4,338	
			8,681

Assuming that the population between the ages of 2 and 15 years has increased in the same proportion as the whole population since 1821, and that the whole population has increased in the same ratio since 1831 as in the ten years preceding that time, the approximate number of children between the ages of 2 and 15 years then found as residing in Shropshire in 1833, was about 75,000. Six Sunday-schools are returned from places where no other schools exist; and the children, 152 in number, who are instructed therein cannot be supposed to attend any other schools; at all other places children have opportunity of resorting to other schools also, but in what number, or in what proportion duplicate entry of the same children is thus produced, must remain uncertain. Fifty-two schools, containing 3595 children, which are both daily and Sunday schools, are returned from various places, and duplicate entry is known to be thus far created. Making allowance therefore for this cause, which prevents accuracy, we may perhaps fairly estimate that less than one half of the children between the ages of 2 and 15 years are under instruction in this county. Thirty-seven boarding-schools are included in the number of daily schools given above. No school in the county is reported as being confined to the children of parents of the Established Church, or of any other religious denomination; such exclusion being disclaimed in almost every instance, especially in schools established by Dissenters, with whom are here included Wesleyan Methodists and Roman Catholics.

Maintenance of Schools.

Description of Schools.	By endowment.		By subscription		By payments from scholars.		Subscrip. and payment from scholars.	
	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.	Schls.	Scholars.
Infant Schools	2	78	2	67	20	558	4	250
Daily Schools	78	2569	53	2,715	356	9,077	55	3865
Sunday Schools	11	833	191	14,616	1	14	37	3218
Total...	91	3480	246	17,398	377	9,649	96	7333

The schools established by Dissenters, included in the above statement, are—

		Scholars.
Daily-schools . . .	15, containing	580
Sunday-schools . . .	82 .	7,812

The schools established since 1818 are—

Infant and other daily schools .	190, containing	6,872
Sunday-schools . .	144 .	12,459

Lending-libraries are attached to 33 schools.

SHROUDS. [SHIP.]

SHROVE-TIDE, or SHROVE-TUESDAY (from the Anglo-Saxon *scrifan*, to confess), signifies the time of confessing sins; for which purpose this day was antiently set apart by the church of Rome as a preparation for the austerities of Lent. This season was likewise called *Fastingtide*, *Fastens*, and *Fast-mass*, by all of which titles it is yet designated in different parts of the North.

In the Reformed Church the antient practice of shriving or confessing at Shrove-tide is discontinued.

After the people had made the confession required at this season by the discipline of the antient Church, they were permitted to indulge in festive amusements, although not allowed to partake of anything beyond the usual substitutes for flesh; and hence arose the custom yet preserved of eating pancakes and fritters at Shrovetide, which has given this day the vulgar appellation of Pancake Tuesday The Monday preceding was, by the vulgar, called Collop Monday, a name which it even yet retains in some places, from the primitive custom of eating eggs on collops or slices of bread, which the less scrupulous and more luxurious moderns have extended to collops of meat.

On these days of authorised indulgence all kinds of recreations were tolerated, provided a due regard was paid to the abstinence commanded by the Church; and from this origin sprang the Carnival. [CARNIVAL.]

To the pastimes of this early age are also to be traced the nearly exploded diversions of cock fighting and cock-throwing, as well as the discontinued customs of whipping-tops, roasting of herrings, Jack of Lent, &c., which three last-named sports were evidently meant as types of the rigour of church discipline. The cock-fightings and cock-throwings in England, which have gone into disuse, were once general throughout the kingdom at this season.

(Brady's *Clavis Calendaria*, vol. i., pp. 199, 200; Brand's *Popular Antiq.*, vol. i., p. 56, &c.)

SHRUB (*frutex*). All plants are divided into herbs, shrubs, and trees. A shrub is a plant with a woody stem, which approaches the tree in its duration and consistence, but never attains the height of a tree, and is generally taller than the herb. It varies in height from about four to twelve feet. Linnæus attempted to distinguish trees from shrubs by the former having buds and the latter having none. But this distinction is of no avail, as plants like the willow, generally called shrubs, possess buds, whilst most trees in hot countries are without them.

In horticulture shrubs are too well known to need a definition. For practical purposes they are divided into the deciduous and evergreen kinds, and each of these kinds may be further divided, according to their hardy or tender habits, their form, size, mode of growth, colour, &c. The most ornamental flowering shrubs are those belonging to the genera Rosa, Rhododendron, Azalea, Kalmia, Andromeda, Vaccinium, &c. Among the evergreen shrubs are the holly, the ivy, the jasmine, the box, various heaths, &c.

Shrubs are often planted together, forming what are called shrubberies, and when the kinds are judiciously selected and arranged, these collections add greatly to the beauty of the gardens and pleasure-grounds where they are introduced.

Shrubs in general thrive in ordinary garden soils, and better in light than heavy lands. Previous to planting them it is always desirable to trench the soil to its full depth. They seldom require manure, except in very poor soils. Evergreens thrive best in loams of a middling texture. Kalmias, Ericas, &c. require peat or heath soil. Deciduous shrubs in general thrive in light loams or sandy soils.

SHUCKBURGH EVELYN, SIR GEORGE, Bart., a gentleman distinguished as a classical scholar as well as for his attainments in mathematical and philosophical learning, was born in 1750, and represented the county of Warwick in three successive parliaments. In 1774 he was elected a fellow of the Royal Society, and in the volume of its 'Transactions' for 1798 will be found the communications which he made to that body concerning the measurement of the heights of mountains by the barometer, and the adoption of a general standard of weights and measures. Together with General Roy he made numerous experiments in order to find the effect of variations of temperature on the volumes of air and mercury; and from the labours of these experimenters there has resulted a rule for obtaining the relative heights of stations, which possesses perhaps all the accuracy of which the barometrical method is susceptible, or which can be required for the purposes of geography. According to Sir George Shuckburgh, the formula expressing the required height in fathoms is

$$(10000\,l \mp 0{\cdot}44\,d)\{1 + {\cdot}0023\,(f - 32^\circ)\};$$

where l is the difference between the logarithms of the heights of the barometer at the two stations; $\mp d$ is the difference between the attached thermometers (Fahrenheit's scale), the negative sign being used when the mercury is coldest at the upper station, and the positive sign in the contrary case, and f is the mean of the temperatures expressed by a detached thermometer at the stations. When the air is tranquil, and the observations are carefully made, this formula will give the required height within two or three feet in four thousand.

It has always been considered advantageous that the units of linear measure and of weight should have a relation to some invariable standard existing in nature, in order that in the event of the values of those units being lost, they may be recovered with accuracy. This was the object proposed by the government of France in 1793, when it was decided that the metre should be a certain portion of the circumference of a meridian of the earth; and to Sir George Shuckburgh belongs the merit of having determined the relation between the yard (the unit of measure in England) and the length of a pendulum which should make a certain number of vibrations in a given time. The subject had already, at intervals, during many years been recommended to the attention of the government, but the inquiry from various circumstances being deferred, it was reserved for private individuals, to whom, for the sake of obtaining accuracy and uniformity in their scientific pursuits, it was of importance to have a precise standard of length, to procure one by their own exertions. By numerous experiments Sir George found that the difference between two pendulums, one vibrating 42 times and the other 84 times in a minute (mean time) in the latitude of London, at 113 feet above the level of the sea, when the mercury in the barometer is at 30 inches, and the temperature is at 60° (Fahr.), is equal to 59·89358 inches according to the parliamentary standard; and it is evident that by repeating such experiments with all due care, the length of a rod containing the same number of inches might be obtained. From the more recent experiments of Captain Kater and Colonel Sabine, the length of a pendulum vibrating one second in London is 39·13929 inches; which gives for the difference between two such pendulums as those above mentioned, 59·90103 inches, a result agreeing with that which had been found by Sir George Shuckburgh within ·00745 inch. This philosopher also ascertained from numerous experiments that a cubic inch of distilled water, when the mercury in the barometer is at 29·5 inches, and the temperature is 60°, weighs in air 252·506 grains, and in vacuo 252·806 grains; hence the exact weight of a grain, and consequently of all other weights, may at any time be obtained. (*Phil. Trans.*, 1798.)

In order that a precise standard of length might be preserved in the country, Sir George Shuckburgh employed Mr. Troughton to make for him a brass-bar, and to lay down on it with great accuracy the length of 5 feet, divided into feet, inches, and tenths of an inch; the bar was 67$\frac{3}{4}$ inches long, 1$\frac{4}{10}$ inch wide, and 0·4 inch thick; and besides the scale just mentioned, there were laid upon it various other measures of acknowledged or reputed authority. This scale is now in the possession of the Royal Society; and in the *Phil. Trans.* for 1798 is a paper by Sir George, in which the scale is described, and the length of 3 feet on it is compared with the length of the old standard yard which was kept at the Exchequer (where it is supposed to have been placed in the reign of Elizabeth) and with that of another standard yard belonging to the Royal Society. The difference between the last-mentioned standards, which was considerable, had been observed by Mr. Graham in 1742.

In 1833 the Royal Astronomical Society caused a new standard measure to be made with all possible accuracy; this is a brass tube, or rather, it consists of three brass tubes drawn within one another, and the scale, which is 5 feet long, divided into inches and tenths, is formed on the upper part of the exterior surface between two lines drawn parallel to the axis of the tube. By careful comparison it has been found that 3 feet on this scale exceeds 3 feet on the Shuckburgh scale by ·000079 inch; and it may be observed here that 3 feet on the latter scale exceed the imperial yard which is at present in use by ·00058 inch. (*Mem. Royal Astr. Soc.*, vol. ix.)

It is said of Sir George Shuckburgh that in matters of science no man was more cautious of making hasty inferences or of forming general conclusions from partial or inaccurate observations. He had travelled on the Continent; and being a diligent cultivator of astronomy, he fitted up an observatory with instruments which he caused to be constructed by Mr. Ramsden. He died at his seat in Warwickshire, September, 1804, in the 54th year of his age, leaving the character of a man of great integrity, and, as a senator, of independent conduct.

SHUMLA, *Schumna*, or *Ciumna*, in 43° 12′ N. lat. and 26° 53′ E. long., is a considerable town in the eyalet (province) of Rumelia and the sandjak (district) of Silistria. It is situated on the northern declivity of the Balkan, in Bulgaria, on the way from Constantinople to Bukharest, at nine days' journey from Constantinople. It is surrounded by walls and defended by a citadel, and although upon the whole it is not well built, there are so many mosques and baths, that the appearance of the town is agreeable. The celebrated mausoleum of Djezaïr-il-Hassan Pasha is one of the greatest attractions and very much improves the dull features of Shumla. There is however much more life than could be expected; the commerce is flourishing, owing to the many roads from the northern provinces which lead through it to the capital; the silk and cloth manufactures are kept in activity by a continual demand; the cotton manufactories, of which there are a great number in this place, supply almost all Bulgaria, and even Wallachia, with the produce of their industry; and the extensive copper trade, which the inhabitants have almost monopolised in the north, enriches the town considerably. The number of inhabitants is between 20,000 and 30,000, and consists of Turks, Bulgarians, Greeks, Armenians, and Jews. The situation of Shumla is on a considerable elevation, but it has not a good climate. Being situated at the spot where the roads from the chief fortresses of the Danube meet, the possession of Shumla is the key of the Balkan. Indeed Shumla was always the point of attack in every attempt to cross over into Turkey. It came into the possession of the Ottoman Porte in the reign of Murad II., when the castle was occupied by Ali Pasha, the son of this sovereign's grand-vizir, in 1472. It was besieged in 1774 by Rumianzow, but without success. In 1810 Kaminskoi was obliged to retreat with a considerable loss, the Russians having again attempted to get possession of the key to Constantinople. But this fortress was not so fortunate in 1828, when General Wittgenstein took it; his conquest however did not compensate for the loss which he suffered of the greater part of his army, partly from the fury of the Turks, and partly from the plague and dysentery which raged in the camp. General Diebitsch had in the meantime crossed the Balkan without coming to Shumla.

There is an interesting account of this town in the 'Description de Shumla,' by Barbié du Bocage, Paris, 1828.

There is in the neighbourhood of Shumla a village called Madara, which well deserves the attention of travellers; it is inhabited solely by women, the number of whom amounts to about 2000. This female community has laws of its own; they are exempt from all taxes, and are noted for their hospitality.

SHUS. [PERSIA; SUS.]

SHUSTER. [PERSIA.]

SI, in Music, the name given by the English, Italians, and French, to the seventh of the syllables used in solmisation; and, by the two last, also to the note, or sound, called B by the Germans and English. [SOLMISATION.]

SIAK. [SUMATRA.]

SIALAGOGUES (from σίαλον, 'saliva,' and ἀγωγός, 'that which leads or brings'), agents which increase the flow of saliva and other fluids from the parotid and other glands in the vicinity of the mouth. They operate in different ways, and are distinguished into local or remote. Of the local, some are gaseous, others are solid; these last are also termed *masticatories.* Of the gaseous, the most familiar is the odour of savoury food, which produces an immediate secretion from the salivary glands, being the primary step in the process of digestion, for the perfect performance of which thorough insalivation of the food is requisite. By the motion of the jaw in the act of mastication a further flow of saliva is occasioned, and this result occurs however insipid or insoluble the substance may be which is moved about in the mouth. Hence even a pebble or mastiche will cause it. But if the substance possess an agreeable aroma, or a considerable degree of pungency or acrimony, a greatly augmented secretion is the consequence. In hot climates piquant articles are extensively used to stimulate the languid action of the digestive organs. [AROMATICS; FOOD.] In local affections of the mouth, nose, or even head, relief is often obtained by exciting the salivary glands to increased secretion, and this is effected by chewing pellitory root and other pungent articles, or holding in the mouth an infusion or tincture of these. Remote sialagogues are first received into the system by the stomach or other channels, and then exert a peculiar influence on the salivary glands. Of these the most familiar is mercury. This often proves highly remedial, especially in the fevers of tropical countries, in which the occurrence of salivation is always regarded as a forerunner of recovery. In persons whose systems cannot sustain mercury, or to whom it is objectionable, a deficiency of saliva, a frequent accompaniment of indigestion, is removed by the Virginian snake-root, alone, or in combination with preparations of copper.

The excessive salivation which results from even a small dose of mercury should cause the utmost caution to be observed in its use; especially as it is extremely difficult to remove it when once established, or even to mitigate its effects. [MERCURY.]

SIALIA. [BLUE BIRD.]

SIAM. Including the countries tributary to or dependent on it, Siam extends from 4° to 22° N. lat., and from 98° to 105° 20′ E. long. It comprehends a vast extent of country in the peninsula beyond the Ganges, and the larger part of the Malay peninsula. The greater part of the boundary by which it is separated from the adjacent countries is imperfectly known, except where it borders on the British possessions, where also it has lately been discovered that the frontier-line differs materially from that which is laid down in the best maps. [TENASSERIM.] On the east of Siam lie the countries constituting the kingdom of Cochin-China or Annam; on the north is China (the province of Yunnan) and that part of Laos which is subject to the Birmans; on the west is the Birman empire, from which it is separated by the river Saluen, the British province of Tenasserim, and the Gulf of Bengal; and on the south are the independent states of the Malay peninsula, Perak and Pahang. That portion of the Indian Ocean which is called the Gulf of Siam, and extends from south-east to north-west above 500 miles, with an average width of about 250, is almost entirely surrounded by the countries subject to Siam. According to the calculation of Berghaus, the boundary-line between Siam and Cochin-China is 1357 miles long; that towards China, 115 miles; between Birma and Siam, 331 miles; and that by which it is separated from the British possessions, 664 miles. The boundary-line which separates it from Perak and Pahang is 230 miles long. The Gulf of Bengal forms a coast-line of 529 miles; and the Indian Ocean, with the Gulf of Siam, one of 1467 miles.

Siam is the largest of the three empires contained in the peninsula beyond the Ganges. Crawfurd estimates the area at 190,000 square miles; but according to the calculation of Berghaus, it is nearly 290,000 square miles. Taking the former estimate, it is about 60,000 square miles larger than the Birman empire, and 7600 square miles larger than Cochin-China.

Surface and Soil.—A considerable portion of Siam is covered with mountains and hills. The mountainous and hilly part appears to be connected with two chains of mountains, running south and north, and terminating at their northern extremity in the snow-covered mountain-ranges which surround the elevated table-land that forms the centre of the Chinese province of Yunnan. North of 22°, and without the boundaries of Siam, both ranges seem to approach so near to one another as to constitute one extensive mountain-region furrowed from north to south by the narrow valley of the river Menam, but after entering Siam the mountains gradually recede, and contain the wide valley of that river.

The western of the two great chains, called by geographers the Mountains of Siam, separates the basins of the rivers Saluen and Menam, and occupies also the northern portion of the Malay peninsula, as far south as 11° N. lat. It extends therefore from north to south about 750 miles. We do not know the width of this range, except towards its southern extremity, where (between 15° and 12° N. lat.) it is probably not more than 70 miles across, but is divided into two ridges, which enclose the narrow valley in which the Tenasserim river runs southward. The greater part of this range has been seen by travellers. The whole of it appears to be covered with jungle or high trees. Some of the summits rise, according to a vague estimate, to between 5000 and 6000 feet. We are no better acquainted with the elevation of the range which runs through the British province of Tenasserim parallel to the shores of the Gulf of Bengal, but it does not in general exceed about 2000 feet. The ridge which extends along the eastern banks of the Tenasserim river is called by the Siamese Sam-ra-yot, or the 'Three Hundred Peaks.' It consists of lofty mountains, extremely rugged on their flanks as well as summits, and rising in innumerable bold conical peaks. This ridge, which lowers considerably as it approaches Kwi Point (1[illegible]° N. lat.), does not come near the Gulf of Siam, but leaves between it and the shores a level country, apparently alluvial, on which rise some insulated peaks. The mountains of Siam terminate near 11° N. lat., on the isthmus of Kraw. Three passes are known to lead over these Mountains between Tenasserim and Siam, but only one of them seems adapted to facilitate the intercourse between the two countries, and it is probable that, in spite of the jealous policy of the Siamese court, a regular communication will soon be established along this road. It leads from Molmein, near the confluence of the river Ataran with the Saluen, along the banks of the first-named river to its source, where the range is passed at a place called Prasong-tshu, or the 'Three Pagodas.' Thence it passes into Siam, and traverses the rich and fertile valley of the river Mekhlong to the town of the same name, which is built where the river falls into the western branch of the Menam river, not far from its mouth.

The high ground which traverses the isthmus of Kraw from north to south, which extends from 12° to 9° N. lat., can hardly be called hilly. It is also separated from both the mountain-ranges which lie north and south of it, the mountains of Siam and those of the Malay peninsula, by deep and wide depressions. The northern of these depressions occurs near 11° S. lat., where the ground that separates the Pakchan river, which falls into the Gulf of Bengal, and the Choomphon river, which enters the Gulf of Siam, is so low, that, according to the statement of the natives, the two rivers often unite their waters during the spring-tides. As both rivers are navigable for boats, it is probable that they might be so connected as to constitute a short and direct water-communication across the isthmus between the Bay of Bengal and the Gulf of Siam. The southern depression occurs at the southern extremity of the isthmus of Kraw, and crosses the peninsula obliquely, beginning on the shores of the Bay of Bengal, east of Phunga or Ponga (8° 1[illegible] N. lat.), and running north-east to the town of Peonem, east of which it expands to a great width, comprehending the low country on both sides of the river Thakham between the towns of Phoon-phin and Chai-ya.

The mountains of the Malay peninsula have been noticed under that head [vol. xiv., 326]. The undulating country which separates the Malay mountains and the mountains of Siam from the Bay of Bengal, and extends a few miles inland, terminates on the shores with a coast of moderate elevation. It is stated to be of slight fertility, and in some parts even barren. But the province of Wellesley, before it was occupied by the British, was also considered as a sterile tract, and yet it has been found to possess a considerable degree of fertility. It is probable that other tracts of similar fertility will be found within the territories of Siam, when they are well cultivated. It is however certain that this portion of the empire is thinly inhabited. At a distance of from 10 to 20 miles, this coast is lined with a series of islands. The long channel between them and the mainland has depth enough for the largest vessels, except near the continent, where it has generally only from four to five fathoms; whilst near the islands there are generally from twenty to thirty fathoms. Many vessels sail through it during the south-western moonsoon, as the heavy sea is greatly broken by the islands, and the gales are not so strong. The islands themselves are rocky, and most of them high: some rise to more than 3000 feet. The channels between them are very deep, and usually free from danger. Most of these islands are only from two to six miles long. The largest, from north to south, are the following: St. Matthew's Island (10° N. lat), also called Elephant Island, is about twelve miles long and six wide, and has at the north part an excellent harbour, which is four miles in length and three in width, and is called Elephant's Harbour. The highest part, situated in the middle of the island, is nearly 3000 feet above the sea-level. Salanga, or Junk Seylon (8° N. lat.), is about sixteen miles long and six wide. It is separated from the continent by the Strait of Papra, in which there are only from two to three and a half fathoms water. On the east side of Salanga are some tolerably good harbours. Provisions are abundant, and tin was formerly exported. Towards its southern extremity is a high mountain. Farther south, between 6° 49′ and 6° 8′, is the group of the Lancava Islands, which, in addition to several smaller ones, contains the islands of Trotto, Lancawi, and the two Laddas. They are also very elevated, and have some good harbours: but though the islands are partly cleared and well cultivated by Malays and some Chinese settlers, the harbours are little frequented.

The eastern coast of that portion of the Malay peninsula which belongs to Siam is much lower and wider, the mountains being frequently fifteen and twenty miles distant. In fertility it is also superior to the western coast: several extensive tracts yield rich crops of rice; and others, though uncultivated and covered with jungle, exhibit a vigorous vegetation. The islands along this coast are not numerous, nor elevated, except Tantalem, the largest, which however is not very high.

To the east of the Mountains of Siam is the large valley of the river Menam. According to Crawfurd, it extends from the most northern recess of the Gulf of Siam to Pech-ai (between 19° and 20° N. lat.) 360 miles; and its breadth at its southern extremity does not exceed 60 miles. Hence he calculates that if its average breadth equals that of its southern extremity, the whole area is 21,600 square miles. In this estimate he seems only to have included that portion of the valley which is subject to annual inundations, and whose soil is therefore alluvial. But it is now known that this alluvial tract towards its southern extremity, at least on the west, is enclosed by a more elevated country of equal width and of considerable fertility. This will greatly enlarge the area of this region. We are however acquainted only with the southern part of it, no European having given any account of the country north of the antient capital, Ayuthia, or Yuthia, which is only 20 miles from the mouth of the Menam in a straight line. In this tract the fertility of the soil is not inferior to that of most countries between the tropics which are subject to the inundations of a large river. The banks of the river, being more elevated than the country at a distance, are studded with villages and towns, and the lower grounds are covered with extensive rice-fields.

The mountain-range which divides the valley of the Menam from that of the river Maekhaun or Cambodja is almost entirely unknown. According to information collected by Sir Francis Hamilton, it would seem that between 19° and 20° N. lat. a great interruption in the mountain-chain occurs, as it was stated to him by a native of Laos, that in these parts an arm of the river Maekhaun branches off and runs to the Menam, so as to constitute, at least during some part of the year, a natural water-communication. This is probable from the circumstance that the Siamese have been able to keep their footing in Southern Laos, or Lanjang, which hardly would have been the case if both countries were separated by a high continuous range, as its southern boundary seems to lie open to Cambodja, a portion of the Cochin-Chinese empire. This mountain-range, which is called the Mountains of Cambodja, in consequence of its dividing the last-mentioned country from Siam, has only been seen by Europeans where it approaches the Gulf of Siam between the river Bang-pa-kung (14° 40′ N. lat.) and Chan-ti-bon (12° 20′ N. lat.), and again between Tung-yai (12° N. lat.) and Kong (11° N. lat.). In these parts it presents itself as an extensive range of moderate elevation, covered to its summits with high trees and vegetation.

Between the towns of Chan-ti-bon and Tung-yai lies a plain, which extends from the shores of the Gulf of Siam far inland, the mountains in these parts receding so far from the shores as not to be visible from the sea. This tract, which constitutes the province of Chan-ti-bon, is one of the most fertile and populous districts in the Siamese empire. The population is stated by some at a million, and by others at half that amount. It is in general well cultivated, and from three to four hundred vessels are employed in taking the produce to Bang-kok, whence a great portion of it goes to China.

That portion of the Siamese empire which lies east of the Mountains of Cambodja belongs to the basin of the river Maekhaun, or river of Cambodja. It is almost entirely unknown, not having been visited by Europeans, except early in the sixteenth century by a Dutchman. It seems to extend in wide plains, which terminate south of 15° N. lat. on the river Maekhaun, which here divides Siam from Cochin-China, but north of 15° the plains reach so far east as to come up to the mountain-range of Cochin-China, whose western declivity is in these parts included within the territories of Siam. This extensive country is supposed to be very fertile, but thinly peopled.

Rivers and Lakes.—The river Saluen, which forms the boundary between Siam and the Birman empire for 150 miles, is noticed under BIRMA [vol. iv., p. 438]. Several of the small rivers which drain the eastern side of the Malay peninsula are navigable for a few miles, as the Thawang, which passes near Ligor (between 8° and 9° N. lat.). But the most important of the rivers of Siam is the Menam, a name which signifies, in the Siamese language, 'mother of waters.' This river rises in the south-western districts of the Chinese province of Yunnan, with two branches. The western and longer one, called Nanting-ho, has its origin near 24° N. lat., and has a general southward course until it joins (south of 22° N. lat.) the other branch, called Maepraen, which is considered by the Siamese to be the principal branch, though its course does not appear to be so long. The united river preserves the name of Maepraen, and traverses Lower Laos, or Yunshan, where it becomes navigable for boats at the town of Chang-mai, or Zamaë, the capital of that country. Farther down the navigation is much impeded by rapids, cataracts, and whirlpools, so that in several places, according to Kämpfer, goods must be taken out of the boats and transported to some distance by land. From the place where an arm of the Maekhaun is said to join the Menam, it appears that the river is called Menam, or Meinam, and, so far as we know, no impediments to navigation occur farther down. Our more exact knowledge of the river begins at Ayuthia, the antient capital, which was visited by Kämpfer in 1690. This intelligent traveller gives a map of the river's course hence to the sea, which, in 1826, the British agent Burney found to be very correct, a rather curious circumstance, as the river flows through an extensive alluvial tract. Kämpfer observes that the river above Ayuthia divides several times, and contains some very large and several smaller islands. On one of the latter Ayuthia is built. The last division of the waters occurs below Bang-kok, the present capital. Kämpfer describes the Menam as a large, deep, and rather rapid river in the lower part of its course, which is navigated by vessels of considerable burden. In his time the middle embouchure was the deepest, and by it large vessels entered the river, but at present both this and the western branch have only from eight to twelve feet of water on the bar. The western branch is called Mekhlong, and the middle one Tachin. The eastern arm, which at present is the only one navigable for large vessels, varies below Bang-kok from three quarters of a mile to one mile and a half in width, and the depth, even close to the low banks, is from six to ten fathoms, whilst its rapidity during the low tide is about three miles an hour. It might therefore be navigated by larger vessels, were it not for an extensive bank which lies opposite its mouth, and extends about ten miles into the sea. The outer edge of this bank, which is only about two hundred yards wide, consists of sand and harder materials, but the rest of the flat is so soft, that when a ship grounds during the ebb, she often sinks five feet in the mud and clay, without however sustaining any damage. The highest water on this bar from February to September is about thirteen feet and a half, and in the remaining four months, in which the country is inundated, somewhat more than fourteen feet. On account of the obstacles arising from this extensive bar, Crawfurd thinks that the navigation of this river ought to be confined to vessels not exceeding 200 or 250 tons burden. The Menam, like all large rivers which have their source or course between the tropics, inundates the flat country contiguous to its banks. In the lower part of the river the water begins to overflow in the month of September, and continues to rise to the beginning or middle of November, when it decreases; and at the end of December the waters re-enter the bed. But it seems that farther to the north the increase takes place sooner, as, according to Crawfurd, the flat boats and rafts of timber and bamboo, loaded with goods of various descriptions, leave Chang-mai in the month of August, and in two months reach Bang-kok, where the river is crowded with them in November and December. The inundations contribute greatly to the fertility of the alluvial tract by the mud which they deposit. The whole course of the Menam does not exceed 800 miles, and this river is therefore greatly inferior to the Irawaddi and Maekhaum.

It is not known if any of the several tributaries of the Menam, which join it in the upper course, are navigable; but this is the case with the two rivers which fall into it from the west near its mouth. The most western, the Mekhlong, which has also given its name to the western embouchure of the Menam, is now known to run through a country in which hills and plains of some extent alternate, and to be navigable for boats to the distance of 200 miles from its mouth, as far as the fortress of Lumtshhang, a place of some commerce. The eastern of these two rivers, which reaches the sea by the central embouchure of the Menam, to which it gives its name, Tachin, is probably navigable for at least the same distance, but this circumstance has not been ascertained. The plains along its banks are inhabited by many Chinese, who cultivate the sugar-cane.

About 30 miles east from the eastern mouth of the Menam is that of the river Bang-pa-kung, which is of considerable size, and probably runs more than 300 miles, as it is supposed to originate in the mountains of Cambodja, between 15° and 16° N. lat. It runs west-south-west. It is said to be not much inferior in size to the Menam itself, and to have the same depth of water on its bar. Within the bar there are from two and a half to three fathoms water. It drains a country highly productive in rice and not inferior in fertility to the alluvial tract that surrounds Bang-kok and Ayuthia.

A large lake is said to exist in the parallel of Ayuthia, but a considerable distance from it to the west. Its name is Lachado, and a river called Talan carries off its waters to the Menam.

Climate.—Considerable variety of climate must exist in a country which extends from the fourth to the twenty-second degree of latitude, and which also presents a great diversity in its surface, on which elevated mountains and extensive plains occur. At Bang-kok, and this is the only place of which we have any detailed information, the year is divided between the dry and the wet seasons, as in other tropical countries. The dry season lasts from October to April, and during this time the weather is temperate, the thermometer sinking in December and January to 72°, but in April and the beginning of May, before the rains set in, it is daily from 95° to 96° in the shade. The periodical rains commence early in May; they are at first light, but about the middle of that month they fall in torrents, and go on increasing, so that in June and July they are extremely heavy. In August the rains are usually light, and they cease in September. The river has then risen so as to inundate the country, and it continues to rise to the end of November. The waters are lowest in the three months preceding the rains. The greatest rise of the river at Bang-kok is 18 feet. During the rains, hard gales from the south and south-west are frequent, and with the rain they moderate the heat.

The prevailing winds are connected with the monsoons. In March, April, and May they generally blow from the south, and are sometimes tempestuous shortly before the rains set in. In June the wind turns to the south-west, and gradually to the west, where it settles during the two following months. In September, when the wind turns to the north-west, the rain ceases, and blows from the north during the remainder of the year. In January it proceeds to the north-east, and in February to the south-west. Thus the prevailing winds blow regularly during the year from all points of the compass. If the change takes place gradually, the equilibrium of the air is not sensibly disturbed but whenever the change occurs within the short period of a day, it is attended with a hurricane.

Productions.—Siam is rich in natural productions. Rice is most extensively cultivated. On the alluvial soil of the Menam it generally yields forty fold; and when only thirty fold, it is considered an indifferent crop. The rice of Siam is not inferior to that of any country, and it is exported to a large amount. With the exception of Bengal, Siam unquestionably exports more rice than any country in Asia. It goes chiefly to China. Maize is also extensively cultivated, particularly in the mountain districts; but it is not exported, on account of its little value and great weight in comparison with rice. It does not appear that wheat or any of the grains which are cultivated in Hindustan are grown in Siam. Of leguminous plants, the Phaseolus radiatus, the Phaseolus maximus, and the Arachis hypogaea are most commonly cultivated, and the first is exported to China and the Malay islands. The roots cultivated in other tropical countries are common, especially the sweet potato. The cocoa and areca palms are cultivated extensively in the lower tracts, and the oil obtained from the first is an important article of export.

Siam is noted for a great variety and abundance of fruit trees, and their produce surpasses that of all other parts of India in flavour. The neighbourhood of Bang-kok is one forest of fruit-trees; and as the Siamese consume a great quantity of fruit, the destruction of these plantations in [illegible] by an inundation, in which the river in October rose three or four feet above its common level, was a serious calamity. The most exquisite fruits are the mango, the mangustan, the orange, the durian, the lichi, and the pine-apple, with many others of inferior value. The mangustan and the durian do not bear fruit in all the British possessions in Hindustan, but yield abundantly in Siam as far north as Korat, between 16° and 17° N. lat. The lichi (*Scytalia litchi*) has been introduced from China.

Several other plants are cultivated as articles of foreign trade. The most important is the sugar-cane, which indeed has been grown in Siam from time immemorial, but only for internal consumption. About 1812 however some Chinese began to grow it on an extensive scale, and the cultivation increased so rapidly, that in 1822 more than 60,000 pekuls or 8,000,000 pounds, were sent to China, the western parts of Hindustan, Persia, Arabia, and Europe. This new branch of industry however did not then extend farther than the lower parts of the rivers Bang-pa-kung, Menam, Tachin, and Mekhlong. The cultivators of the cane are always Siamese, but the manufacturers of sugar are invariably Chinese. Black pepper of a superior quality is cultivated in the country east of the Gulf of Siam to the amount of 60,000 pekuls, or 8,000,000 pounds, nearly the whole of which is exported to China. Tobacco, which formerly was imported, is now grown so generally, that considerable quantities are exported to Cochin-China and to several of the Malay countries; the best is grown in the countries east of the Gulf of Siam. Cotton does not succeed in the low countries, and is only cultivated in the more elevated tracts on the Malay peninsula, and in those which divide the alluvial region of the Menam from the Mountains of Siam. It is of good quality, and annually sent to the Chinese island of Hainan to the amount of 20,000 pekuls.

The forests, which cover nearly all the mountain-ranges of this country, yield several articles of trade. Cardamums are collected in the forests on the Mountains of Cambodja, and go to China, where they fetch a very high price. In the mountainous and woody districts of Laos a gum is collected which resembles benzoin, with which it has long been confounded. But the real benzoin is an object of cultivation in Sumatra, and the kam-nyan, as the Siamese call that which is collected in their country, is the produce of a tree that grows spontaneously in the forests of some districts of Laos. It is comparatively cheap and abundant. Gamboge, a well-known pigment, is collected in the mountains of Cambodja, within the boundaries of Siam, and Crawfurd thinks that this is the only part of the world in which it is produced. Aquila-wood is procured in the countries east of the Gulf of Siam, as far north as 13° 30′ N. lat., and considerable quantities of it go to China, where it is used as a perfume in the temples. Sapan-wood is got from the forests, with which the mountains of Siam are clothed between 10° and 15° N. lat. In point of quantity, if not of value, it is the most considerable of all the exports of Siam. It is principally sent to China, but recently a very considerable quantity has been exported to Bengal and Europe.

The forests of Siam contain many valuable timber-trees; one of them yields a considerable article of export, though, as Crawfurd supposes, it has not yet found a place in any botanical system. It is called by the Siamese *Wai-deng*, or red wood, and by the Portuguese *Pao Rosa*, or rose-wood, but it does not resemble the rose wood used in Europe, though it is used in China, to which large quantities are exported, for cabinet-work. This tree is only found on the mountains of Cambodja which surround the upper course of the river Bang-pa-kung, and it grows to a large size. The teak-forests are very extensive, but all of them are in Laos, or north of 16° N. lat. Great numbers of trees are floated down the Menam, when the river is swollen, to Bang-kok: the consumption of teak timber in the lower districts is very considerable.

In Siam the elephant exists in the greatest perfection. The finest are found in the forest of Suphan, between 14° and 15° N. lat., west of Bang-kok, but they inhabit every part of the kingdom. In Bang-kok their use is prohibited, except to a few persons of very high rank. In all other parts of the country they are freely employed, both for riding and as beasts of burden, especially in Southern Laos, whose capital, Lanjang, takes its name from this circumstance, signifying 'the place of ten millions of elephants.' The number of wild elephants is very great, and they are regularly hunted on account of the government. The ivory, hides, and bones are largely exported to China. The buffalo is numerous in the alluvial tracts, where it is preferred to the ox for agricultural labour, on account of its superior strength and its habits, which are more suitable to a marshy soil. Black cattle are more numerous in the more elevated districts, and are only kept for agricultural purposes, their milk being too trifling in quantity to be useful, and the slaughter of them is forbidden even to strangers. But the numerous wild cattle which are found in many parts of the country are shot by professed huntsmen, for their hides, horns, bones, and flesh; the flesh, after being converted into jerked beef, forms an article of trade with China. The horses of Siam are of a small kind, resembling our ponies. A small kind of goat is kept about the temples, which produces very little milk. Hogs are very numerous, both in a domestic and in a wild state. The lard, prepared with great care, is exported to the European settlements in the neighbouring countries. Fowls in their wild state exist in the forests of Siam, and the common fowl is reared in the lower countries.

The double-horned rhinoceros is more frequently met with in Siam than in any other country: it is hunted for its hide and horn, both of which are exported to China. A rhinoceros hide brings, weight for weight, nearly double the price of any other hide. It is said that a thousand rhinoceros horns are annually sent to China, where they are much valued for supposed medicinal virtues. The tiger is extremely common, though not equal in size to that of Bengal: his bones and skin constitute a considerable article of commerce with China; the bones are used by the Chinese as a medicine. The black tiger is by no means rare. The skins of leopards, which are also very common, go to China. The true civet (*viverra civetta*) is reared by the Siamese for its musk. The scaly skin of the pangolin (*manis pentadactyla*) is sent to China, where it also appears to be used for its supposed medicinal virtues. There is also the orang-utan. There are seven different kinds of deer, among which the common stag (*Cervus Elephas*), the muntjac, and the chevrotin (*Moschus pygmæus* and *Javanicus*) are most common.

Common ducks are reared in great numbers by the Chinese, but geese are almost unknown. The peacock is common in the forests, and the feathers are exported to China. There are several species of pheasants and pigeons, and also of wading birds. The feathers of the king-fisher, the blue jay, the pelican, and several birds of the crane and stork families, are sent to China. There are tortoises and crocodiles in the Menam, but they are not so common as in the Ganges. The green turtle (*Testudo Midas*) abounds on the islands along the eastern shores of the Gulf of Siam, and the eggs are sent to Bang-kok, where they are used for food. Lizards and serpents are numerous, but few of the latter are poisonous.

Fish is abundant, but of very inferior quality; several kinds however are dried and exported. Shrimps dried and prepared are an article of export under the name of *balachang*. The *coccus lacca* produces the dye or gum called lac in commerce. It is found in the forests of the northern provinces of Siam Proper, in Laos, and in the mountains of the Malay peninsula. The lac of Siam is of very superior quality, containing a larger portion of colouring-matter than that of Bengal and of the Birman empire. It is exported to China and the European settlements.

Several kinds of animals in Siam contain individuals of a white colour, which is never the case in other countries. Besides white elephants, which are kept in the stables of the king, and treated with a kind of veneration, Finlayson found white monkeys, white buffaloes, and white deer, and he observed even a white porpoise in the Gulf of Siam. He thinks that this anomaly in the colour of the animals is connected with the peculiarities of the climate.

Gold is found in the mountains of the Malay peninsula, and at the southern extremity of those of Siam, and is worked in some places; but the quantity produced is not sufficient for the consumption of the country, owing to the quantity used in gilding temples and images. This metal is accordingly imported from the Malay countries. Tin exists in many places in the mountains where gold is found, but especially in those of the Malay peninsula, where it is worked, and also on the island of Salanga. It constitutes a considerable article of export. Iron is very abundant in both ranges which form the boundary of the valley of the Menam, and is worked on a very extensive scale. Copper and lead are found in some places, and worked to some extent, especially the latter. Zinc is said to abound, but is not worked. Antimony is worked on a small scale. The only precious stones which are known to exist in Siam are the sapphire, the Oriental ruby, and the Oriental topaz, which are obtained by digging the alluvial soil at the bottom of the hills that surround the plain of Chan-ti-bon; but the sapphire and the ruby are inferior to those of Birma. Salt is made in the low wooded and uninhabited country which extends between the mouths of the Menam along the sea, as in the Sunderbunds of Bengal.

Inhabitants.—The population of Siam is composed of different nations, part of whom are aborigines, and part emigrants from other countries. The first class of inhabitants consists of Siamese, Laos, Cambodjans, and Malays, who have attained a certain, though different degree of civilization, and of Kariang, Lawa, Kha, Chong, and Samang, who occupy some mountain-regions, and seem to be backward in civilization. The immigrant nations are Chinese, Mohammedans, Hindus, Peguans, and Portuguese.

The Siamese, Laos, Cambodjans, and Malays seem to belong to the same race with the Birmans and inhabitants of Cochin-China. They are all members of the great Mongol family, and they are all shorter than the nations of the Caucasian race. The average height of the Siamese is five feet three inches. The skin is of a lighter colour than that of the Asiatics to the west of the Ganges, a colour which, in the high ranks, where a yellow cosmetic is generally used, approaches that of gold. The texture of the skin is remarkably smooth, soft, and shining. They have a strong tendency to obesity. The form of the head is most remarkable. The most characteristic features are the cheek bones, which are large and prominent, and give to the whole face the form of a lozenge, instead of the oval figure which constitutes beauty among the nations of Western Asia and Europe. The forehead, though less prominent towards the sides, is broad, and covered with the hairy scalp in greater proportion than in any other people. In some it descends to within an inch, or even less, of the eyebrows, covers the whole of the temples, and stretches forward to within nearly the same distance of the outer angle of the eye. The diameter of the head from the front backwards is very short, and hence the general form is somewhat cylindrical; and, in a great number of instances, from the crown to the nape of the neck is nearly a straight line. The top of the head is often unusually flat. The hair is black, thick, coarse, and long. The face differs greatly from that of the European or Hindu, the features never being bold, prominent, or well defined. The nose is small, round at the point, but not flattened as in the negro; and the nostrils, instead of being parallel, diverge greatly. The mouth is wide, but not projecting; the lips are rather thick. The eyes are small, and the outer angles are more turned up than in the western races, though not so much as in the Chinese. The eye-brows are neither prominent nor well marked. The beard consists only of a few straggling hairs.

The Siamese call themselves Thay, but are called by the Malays, and some other neighbouring nations, Zëam, or Zam, from which word the term Siam is derived. They speak a peculiar language, of which however that which is spoken in Laos is only a dialect. It consists of monosyllabic words; but these are mixed with a considerable number of words taken from the Pali language, and others from the Chinese. The alphabet is mixed up with characters taken from the Pali and Devanagari. It is used in common life, and some poetry and novels, as well as historical compositions, are written in it. But the sacred literature is only written in the Pali language, which, together with the worship of Buddha, was introduced into Siam and the adjacent countries in the fourth century of our æra. The temples of Buddha are the only edifices which display any architectural character. [BANG-KOK, vol. iii., p. 372.]

The Siamese have made considerable progress in the cultivation of the soil, and they have very extensive orchards; but their houses and the dress of the common people indicate that in other respects they have not advanced far in the arts of civilization. The Chinese, who during the last century settled in large numbers in Siam, have introduced several branches of industry, but it does not appear that any of them have been adopted by the Siamese.

The inhabitants of Laos [LAOS] and those of Cambodja are about equal in civilization to the Siamese.

The two migratory tribes of the Kariang and Lowa occupy some mountain-tracts in that portion of Laos which is subject to Siam. The last-mentioned tribe has made some progress in civilization, as they work the lead-mines, which are abundant in their country. The Kha tribe inhabits the mountains of Cambodja between 15° and 17° N. lat., and the Chong occupy their southern extremity between 11° and 14° N. lat. The Samang tribe exists only in that part of Siam which is situated on the Malay peninsula south of the isthmus of Kraw. It belongs to the race of the Austral negroes, or Papuas, who are found in the interior of almost all the larger islands of the Indian Archipelago east of the Andaman Islands.

Among the foreign colonists the Chinese are the most numerous, though Crawfurd says that, according to some statements, their number does not exceed 440,000; he adds, that it was stated by some to be as high as 750,000. More recent travellers have found that their number at Bang-kok alone exceeds 300,000, and it seems that they are dispersed all over the country, working the mines, manufacturing sugar, occupied in several trades, and many of them as merchants. Some few of them emigrate from Yunnan to Laos, but the larger number come from the provinces of Canton and Fukian. Those from the island of Hainan and the provinces of Chekiang and Kiangnan are less numerous. They soon assimilate with the Siamese, intermarry with them, and adopt the religion of Buddha as practised in Siam; but they invariably dress in the costume of their own country.

There are a few Hindus, and a greater number of Mohammedans, who have immigrated from the peninsula of Hindustan. They preserve their religion and dress. The Mohammedans have nine mosques at Bang-kok, but they are all very poor buildings.

A few Cochin-Chinese have also settled in the country; and a number of Peguans, expelled from their country by the Birmans, have taken refuge in Siam.

Population.—Crawfurd estimates the population, according to the nations inhabiting Siam, as follows:—

Siamese . . .	1,260,000
Laos	840,000
Peguans . . .	25,000
Cambodjans . . .	25,000
Malays	195,000
Chinese . . .	440,000
Natives of Hindustan . .	3,500
Portuguese . . .	2,000
	2,790,500

Recent travellers who have visited Siam think that the population is considerably underrated; and though they do not state in what particulars Crawfurd's statements are erroneous, they make the whole population amount to between 5,000,000 and 6,000,000. This assertion is supported by the travels of Leal, who went from Molmein to Bang-kok through the valley of the river Mekhlong, and found several towns there whose population he estimated at between 5000 and 13,000 each.

Divisions and Towns.—Siam is composed of countries which constitute the kingdom of Siam, and are immediately subject to the sovereign, and also of tributary countries, governed by their own princes, who are dependent on the king of Siam. The former consist of the kingdom of Siam, called by the natives Iudara Thay-nu, and of a portion of the kingdom of Cambodja, called by the Siamese Iudara Shan. The tributary princes inhabit the countries north and south of the kingdom. On the north are the countries of the princes of Laos; and on the south the princes who govern a portion of the eastern coast of the Malay peninsula.

1. Iudara Thay-nu, or Siam Proper, comprehends the countries along the eastern coast of the Gulf of Siam, as far inland as the mountains of Cambodja, and those in the basin of the river Menam as far north as 19° N. lat., together with the isthmus of Kraw, and the Malay peninsula as far south as 7° N. lat. According to the most recent information, the small Malay kingdom of Queda has been incorporated into Siam Proper, and at present constitutes a part of the province of Ligor. By this accession the southern boundary of Siam Proper has been extended to 5° N. lat., and it surrounds the British colony of Wellesley Province [PENANG.] It comprehends all the coast-line of Siam, except that of the tributary Malay states which lie south of it, and all that has been stated respecting the climate and productions refers especially to this part of Siam. It is divided into eighteen provinces, which have been laid down in Berghaus's map according to the statements of the French traveller De la Loubère, who was there towards the end of the sixteenth century.

On the banks of the Menam river are Bang-kok, the new capital [BANG-KOK], and Ayuthia, the antient capital. The last-mentioned place was taken in 1767 by the Birmans, and from that time ceased to be the capital. Modern travellers have not been permitted to visit it, but Kämpfer, who was there in 1690, describes it as a large place, about nine miles in circumference, but adds, that a part of the enclosed area was laid out in extensive gardens, though other parts were closely occupied by houses and temples. Crawfurd was informed that in population it was equal to Bang-kok in [illegible]. It is built on an island formed by two arms of the river Menam, and is also called Duarawadi, and sometimes Judara, or by the Europeans Siam. The country which extends from this town southward to Bang-kok and the mouth of the river is well cultivated and covered with villages, except near the sea, where the low shores, inundated by the high tides at full and change, are covered with trees, and only inhabited by persons who make salt.

Bang-pa-söe is near the mouth of the river Bang-pa-kong, which has a mud-bar with only twelve feet of water on it, but within the river it deepens to from two and a half to three fathoms. Around it is a large tract of low alluvial ground of great fertility and very productive in rice and sugar-cane. The town is a considerable place, and carries on an active commerce with Bang-kok. Farther up on the banks of the same river is the town of Patriyu, which contains a considerable population, and is fortified.

Chan-ti-bun is the capital of a province of the same name, which, according to some statements, contains a population of a million, and according to others only half that number. The town has 30,000 inhabitants, and exports the produce of the province, consisting of rice, pepper, gamboge, cardamums, and aquila-wood; the pepper amounts to 40,000 pekuls. It is built on a small hill, at the foot of a mountain, near the banks of a river, which at its mouth forms a harbour that affords anchorage in five or six fathoms water, but the river is only navigated up to the town by boats of from 300 to 1000 pekuls burden, which carry goods from this place to Bang-kok. The number of such vessels employed in this trade is stated to be between 300 and 400.

South of Chan-ti-bun is the town of Tung-hay, near the mouth of a small river which falls into a broad arm of the sea. It exports pepper, aquila wood, and pepper; of the last, about 15.000 pekuls to Bang-kok.

Pi-sa-luk is a considerable town, which Crawfurd states to be on the banks of the Menam, but in Berghaus's map it is placed on one of its tributaries, near 18° 30′ N. lat.

Leal in passing from Martaban through the valley of the Mekhlong river found some commercial towns there. At the mouth of the river is the town of Mekhlong, with 13,000 inhabitants, which has a harbour for small vessels, and carries on a considerable trade. Rat-phri has 10,000, Pak-prek 8000, and Bant-chiom 5000 inhabitants, and these places have a considerable trade with the adjacent countries. Much sapan-wood is cut in the forests on the neighbouring mountains. At Lamtchang, which is a small place, but has some commerce, the river becomes navigable. South of Mekhlong, on the shores of the Gulf of Siam, is the town Pri-pri, which has a considerable population, and exports rice and palm-sugar. The harbour is only accessible to vessels of small burden. From Puchpuri, which lies a little more to the south, a road formerly led to Mergui, at the mouth of the river Tenasserim, by which some commerce was carried on between the Gulf of Bengal and that of Siam. But this road is no longer used, and we have no account of the town of Puchpuri.

On the isthmus of Kraw, along the coast of the Gulf of Siam, are the towns of Choomphon, Chai-ya, Bandon, Phum-phin, and Phosuga. Choomphon contains about 8000 inhabitants but has little trade. A road leads from this place to Pakchan in Tenasserim, but it is little used. Near 9° 40′ is an extensive flat, intersected by several branches of the sea or rivers, on which three small towns are situated, Chai-ya, Bandon, and Phum-phin, which have some trade in rice, and timber, which grows in the neighbourhood, and also in tin. The tin is brought from Salanga by means of a road which traverses the isthmus, passing through Pennon, and terminates on the Gulf of Bengal at Poonga, a town with 4000 inhabitants, situated at the northern extremity of the bay formed by the island of Salanga.

In the part of Proper Siam which lies south of the isthmus of Kraw, on the Malay peninsula, are several towns. Ligor has about 5000 inhabitants, and some trade with China, to which country cotton, black pepper, tin, and rattans are exported. The harbour can only be entered by small vessels. Talung lies farther to the south, on a river which falls into the channel between the mainland and the island of Tantalem. From this place a road crosses the peninsula, which leads to Trang, a small harbour and town on the Gulf of Bengal; it is not much used. Still farther south, and near the boundary of the Malay kingdom of Patani, is the town of Sungora or Sungkla, which is built partly on the continent and partly on the southern extremity of the island of Tantalem. The harbour is frequented yearly by two or three Chinese junks, which export tin, pepper, rice, and sapan wood. A road leads from Sungora across the peninsula to Queda.

Samui, an island in the Gulf of Siam, is also called Carnam on our maps. It is near 10° N. lat., and several miles from the eastern coast of the isthmus of Kraw. It is not large, but fertile and a place of trade, being visited annually by some Chinese junks, which export cotton and birds' nests. The group of the Sichang Islands lies within the more narrow portion of the Gulf of Siam, not far from the eastern coast. They are eight in number, and the largest, properly called Sichang, is five miles in length, and about a mile and a quarter in its broadest part. Between this island and Koh-kam, the next in magnitude, is an excellent harbour, which may become the station of large vessels trading with Bang-kok, as such vessels cannot pass the mud-bank which lies before the mouth of the Menam.

II. That portion of the kingdom of Siam which formerly belonged to the kingdom of Cambodja lies on the west of the great river Maekhaun, and is called Bangtang. It has not been visited by Europeans. It is stated to consist of extensive level flats, which stretch from the river many miles westward to the mountains of Cambodja, but the population is said to be small.

III. and IV. The tributary states of Laos, and those on the Malay peninsula are noticed under LAOS and MALAY PENINSULA.

Manufactures.—The Siamese do not distinguish themselves in any of the useful arts, and are much behind the Hindus and Chinese. Even their vessels and trinkets of gold and silver are imported from China. But certain gold and silver vases are fabricated in the palace of the king, and presented to the chiefs as insignia of title and office. They are of handsome form and neat workmanship. The manufacturing of silk and cotton stuffs is wholly in the hands of women; the fabrics are of a very coarse and homely texture, and greatly inferior to those made in Java and Celebes. A common description of coarse pottery is made in the country, but all the ordinary and better descriptions are imported from China, and in large quantities. The Chinese, who settled in Siam during the last century, have introduced some branches of industry. Besides the fabrication of sugar, which they have greatly extended, and the working of the neglected mines of iron, they carry on the trades of blacksmith, tin-smith, and currier on a large scale. Considerable quantities of wrought-iron are produced by them; and at Bang-kok there are several extensive manufactures of cast-iron wholly conducted by Chinese. As the articles made in them are remarkably cheap, they find a ready sale among the Malay tribes on the peninsula, and in the Indian Archipelago. The manufacture of tin vessels is very considerable, and the utensils, being polished bright, and often of very handsome forms, give an air of extreme neatness to the shops in Bang-kok in which they are sold. The preparation of leather is carried on to a great extent, not for the purpose of making shoes, which are scarcely used, but for covering mattresses and pillows, and for exportation to China. After being tanned, the leather is dyed red with the bark of a species of mimosa. The hides are principally those of the deer, but also of black cattle and the buffalo. Tigers' and leopards' skins, &c. are preserved with the fur on, and exported to China. From six to eight junks of the largest description are annually built at Bang-kok.

Commerce.—Siam in a commercial point of view is considered the most important of the three empires which divide among them the countries between the Gulf of Bengal and China. As all the provinces of the empire produce some articles which are in demand in foreign countries, and nearly all the foreign commerce is at present concentrated in the town of Bang-kok, the inland and coasting trade is very considerable. The most important branch of inland commerce is that with the northern provinces of Siam Proper and with Laos, and the number of boats which come down the Menam must be very great, as in November and December the river at Bang-kok is crowded with them. The goods brought down consist of grain, cotton, sapan-wood, oil, timber, stick-lac, benzoin, some raw silk, ivory, and bees'-wax, with horns and hides; and the returns are salt, salt fish, and Chinese, Indian, and European manufactures, and also those of Bang-kok. The produce of the province of Bangtang, and also of Lanjang or Southern Laos, reaches Bang-kok by the river Bang-pa-kung, which in the rainy season has a depth of from 11 to 12 feet in the greatest part of its course, and in the dry season from three to four, and is therefore navigable during the former for boats of considerable burthen, and at all times for small boats. By this route are brought down gamboge, cardamums, stick-lac, varnish, raw hides, horns, and ivory. From the countries west of Bang-kok, especially those on the banks of the rivers Mekhlong and Tachin, great quantities of sugar, cotton, and sapan-wood are brought to Bang-kok. Goods are in general directly exported to China from the other ports; this does not appear to be the case with those of the rich province of Chan-ti-bun, probably on account of the shallowness of the ports, and hence, as already stated, from 300 to 400 small vessels are employed in the coasting trade between that province and the capital.

The most important branch of the foreign trade of Siam is that with China. It is partly carried on by Chinese vessels, but mostly in vessels built in Siam and navigated by Chinese. The ports of China which trade with Siam are Canton, Kiang-mui, and Chang-lim in the province of Quantong or Kuantong, Amoy in Fokien, Ningpo in Che-kiang, and Shanghae and Soocheu in Kiangnan, besides several ports of the great island of Hainan. They arrive at Bang-kok with the north-east monsoon, from January to the beginning of April, and sail from the Menam in June and July, when the south-west monsoon is strongest. The following is a list of the principal commodities imported from China: coarse earthenware and porcelain, spelter, quicksilver, tea, vermicelli, dried fruits, raw silk, crapes, satins and other silk fabrics, nankeens, shoes, fans, umbrellas, writing paper, sacrificial paper, incense rods, and many minor articles. A considerable number of passengers come annually to settle in Siam. The following commodities are exported to China: black pepper, sugar, tin, cardamums, aquila-wood, sapan-wood, red mangrove bark, rosewood for furniture and cabinet-work, cotton, ivory, stick-lac, rice, areca nuts, salt fish, the hides and skins of oxen, buffaloes, elephants, rhinoceroses, deer, tigers, leopards, civet-cats, the pangolin; the belly-shell of a species of land tortoise; the horns of the ox, deer, buffalo, and rhinoceros; the bones of the ox, buffalo, elephant, rhinoceros, and tiger; dried deers' sinews, and the feathers of the pelican, of several species of stork and crane, of the peacock and kingfisher, and also edible birds'-nests. Crawfurd, from whom these notices of the commerce are taken, has formed an estimate of the number and tonnage of the vessels employed in it, which shows that at that time (1818) the trade had attained great importance. Canton is visited by three large junks of from 10,000 to 15,000 pekuls and fifty of from 2000 to 5000 pekuls, Chang-lim by two of 7000 pekuls, Amoy by two of 6000 pekuls, Ningpo by eight of from 6000 to 8000 pekuls, Soochen by one of 5000 pekuls, and the great commercial town of Shang-hae is visited annually by fifteen of from 5000 to 8000 pekuls. These vessels are built in Siam, and their tonnage may be assumed at 393,000 pekuls, or 24,562 tons. Chinese vessels come from Kiang-mui, about five in number, having a tonnage of from 3000 to 5000 pekuls; from Chang-lim one of 3000 pekuls; and from Amoy two of 3000 pekuls each. Canton, Ningpo, and Shang-hae have no trade with Siam under the Chinese flag; but all the junks that carry on the trade with the island of Hainan belong to China. They are small vessels from 2000 to 3500 pekuls, and seldom less than fifty come yearly. These Chinese vessels probably employ 168,500 pekuls, or 10,531 tons, of shipping, and the whole trade not less than 561,500 pekuls, or 35,093 tons. Though this estimate may appear an exaggeration to persons not acquainted with the great natural wealth of Siam, it seems that Crawfurd has not taken into account the junks that visit the smaller harbours of Tung-hay, Mekhlong, Phri-phri, Chai-ya, Phun-phin, Ligor, and Sungora. He observes that the crews of all these vessels are entirely composed of Chinese, except those which go to Canton; and he concludes that the Siamese, like the Europeans, are excluded from all other parts of China. Besides the trade with China, which is carried on by sea, there is an overland trade between Laos and the province of Yun-nan, but as the roads traverse high mountain-ranges, the commerce is not very active. The imports consist of coarse Chinese woollens, some English broad-cloths, pins, needles, and other descriptions of hardware, with some gold, copper, and lead. The returns are principally ivory, stick-lac, rhinoceros horns, and some minor articles.

It does not appear that any commercial intercourse exists between Siam and the Birman empire. It is probably prevented by the petty warfare which is continually going on in the thinly inhabited districts along the banks of the Saluen river, and which has for its object the making of prisoners, who are sold as slaves. Such a warfare does not seem to exist on the boundary-line between Siam and Cochin-China; and it is probable that a portion of the produce of Southern Laos, or Lanjang, and of the province of Bantabang, finds its way hither to Saigan or to Kang kao. With Cochin-China the Siamese have also a considerable commerce by sea. From 60 to 80 junks annually visit the ports of that part of Cambodja which is subject to Cochin-China, especially Pongsom, Kang-kao, Tee sia, and Kamao, and that of the great commercial town of Saigun, and a small number go to Fai-fo and Hue, in Cochin-China Proper. The exports of Siam consist of unwrought iron, iron pans, tobacco, opium, and some Chinese, Indian, and European manufactures. The returns are wrought and unwrought silks, mats for bags and sails, gamboge, cardamums, ivory, hides and horns, with dried deer's flesh and salt fish, chiefly for the Chinese market. Within the last few years a commercial intercourse has been established between Molmein in Tenasserim and the northern districts of Siam. The British colony is supplied with live stock, and the trade seems gradually extending to many other articles.

The most important trade, next to that with China, is with the European establishments on the Malay peninsula, and the Sunda Islands, especially with the British colonies of Singapore, Malacca, and Pulo Penang, and with the Dutch establishments of Batavia, Cheribon, and Samarang in Java, Pontianac in Borneo, and Rhio in Bintang. The staple exports of Siam to these colonies are sugar, salt, oil, and rice, to which may be added the minor articles of stick-lac, iron pans, coarse earthenware, and hogs' lard. The returns are British and Indian piece-goods, some British woollens, opium, glass, with the produce of the adjacent countries which are suited for the Chinese market, such as pepper, tin, dragon's blood, rattans, tre-pang, birds' nests, and camphor. In 1824 the number of Siamese junks which entered the ports in the Straits of Malacca, and all of which finally cleared from Singapore, amounted to 44, and ten years ago to between 60 and 70. If those which do not touch at Singapore are added, the number probably exceeds 200. Their ordinary tonnage is from 1000 to 3000 pekuls, though there may be a few as large as 6000 or 7000. Taking the average of each junk at 2250 pekuls, the whole trade amounts to 450,000 pekuls, or 28,125 tons. The crews of these vessels are almost exclusively Chinese, but the vessels are built at Bang-kok.

Crawfurd is of opinion that the trade of Bang-kok far exceeds that of any other Asiatic port in which Europeans have not settled, with the exception of Canton. But the trade of Shang-hae is certainly much more extensive than that of either Canton or Bang-kok. [SHANG-HAE.]

Formerly the commodities of Hindustan and Europe reached the capital of Siam by being transported across the isthmus of Kraw and the Malay peninsula, by the roads which connect Poonga with Chai-ya, Phun-phin, and Ban-don, Trang with Ligor, and Queda with Sungora. The goods were carried overland by elephants, the only animals of burden used in these parts, and the journey took from five to seven days. The goods were shipped on the shores of the Gulf of Siam for the capital. By these roads the tin, ivory, and birds' nests of Salang are still brought to Siam; but not the manufactures of Europe and Hindustan, as Singapore is a better emporium for procuring the goods, and the conveyance by this route is less expensive.

History.—The early history of Siam is entirely unknown. In 1511 the Portuguese, after the conquest of Malacca by Albuquerque, established an intercourse with Siam. In the sixteenth century, Siam was for many years subject to the Birmans, but recovered its independence towards the close of that century. In 1612 the first English vessel went to Ayuthia. Towards the end of the seventeenth century a European adventurer, a native of the island of Cephalonia, called Phaulcon, was raised to the rank of *phraklang*, or foreign minister of Siam. Previously to his arrival in Siam he had served as a common sailor, mostly in English vessels. By his talents he gained the esteem of the king, and was by degrees promoted to one of the most important offices of government. He persuaded the king to encourage the civilization of his subjects by inviting European settlers, and for that purpose to send an embassy to Louis XIV. of France. This embassy appeared in Europe in 1684, and the king of France sent two embassies to Siam in 1685 and 1687, and also a corps of 500 French soldiers. Phaulcon put the French in possession of the fortress of Bang-kok, which, though then a small place, had the command of the shipping in the river. It appears that relying on these European troops and his influence, Phaulcon intended to bring about a revolution, and to put a person on the throne who, though related to the king, had no claims to the crown. But the conspiracy was discovered, and in 1690 a revolution took place, through which the reigning family lost the throne, the minister Phaulcon his life, and the French were expelled from the country. In the early part of the eighteenth century a civil war desolated the country, and in this state of things the Birman sovereign Alompra meditated the conquest of Siam. He was prevented from the execution of this design by his death (1760), but one of his successors prosecuted his plan, and after laying waste the country, the Birmans took the then capital, Ayuthia. The king of Siam had been killed in the assault, and his family was carried away to Ava as prisoners. Soon afterwards the Birman army left the country, and a chief of Chinese descent seized upon the throne and proclaimed himself king. His name was Phia-tak. He put down the insurrections in the kingdom, established his residence at Bang-kok, and successfully resisted the attacks of the Birmans. But in 1782 he was deprived of his throne and life by an insurrection which placed the reigning family on the throne. Some further attempts of the Birmans to conquer at least a part of Siam entirely failed, and a truce was at last concluded between both parties in 1793. Since that time no remarkable event has taken place in the history of Siam.

Government.—The government of Siam is despotic, not even limited by antient customs, by the established tenets of religion, or by the authority of hereditary chiefs. In Siam Proper there are no persons who by birth have any privileges, though in Laos and on the Malay peninsula there exist hereditary princes. To conceive an idea of the awe in which the king is held by the people, it need only be mentioned that his subjects cannot venture even to utter his name. It is certainly never mentioned in writing, and is said to be known only by a very few among his principal courtiers. Crawfurd thinks it doubtful whether the king of Siam has in reality any other name than the formidable epithets under which he is usually mentioned, as 'the Sacred Head of Heads,' 'the Sacred Head of Lives,' 'the Owner of All,' &c. His health must not be inquired after, because, however ill he may be, it must be taken for granted that he is free from bodily infirmities. No heir to the throne is appointed during the life-time of the king; for to imagine his death is considered high treason. Consequently, at the demise of a king the throne is generally disputed by any persons who think themselves entitled to it, and on such an occasion civil wars can rarely be avoided.

(Kämpfer's *History of Japan, together with a Description of the Kingdom of Siam*; Crawfurd's *Journal of an Embassy to the Courts of Siam and Cochin-China*; Finlayson's *Mission to Siam and Hué*, by Raffles; Moor's *Notices on the Indian Archipelago*; Leal, in Berghaus's *Memoir zur Karte von Hinterindien*; and Ritter's *Erdkunde von Asien*, vol. iii.)

SI'AMANG. [APE, ii., 148; HYLOBATES, xii., 408.]

SIASI. [SULO ARCHIPELAGO.]

SIBERIA is the name of that part of the Russian empire which is in Asia, and extends from the Ural Mountains, which divide Europe from Asia, eastward to the seas of Okhotzk and Kamtchatka, both of which are parts of the Pacific Ocean. It lies between 45° 30′ and 77° 40′ N. lat. Its most northern point is North-East Cape, or Siwero Vostochnii Noss, between the embouchures of the rivers Yenesei and Lena, which reaches to about 77° 40′, and approaches nearer to the pole than Smith's Sound in Baffin's Bay, the most northern point of America visited by Europeans. The most southern point of Siberia is near 79° E. long., north of the lake of Balkatch, where it extends to 45° 30′ N. lat. From west to east Siberia extends from 60° to 190° E. long. The most eastern point is East Cape, or Vostochinii Noss, which is only about 48 miles from Cape Prince of Wales in America, from which it is separated by the narrowest part of Behring's Strait. The greatest length from east to west exceeds 3600 miles, and the greatest width from north to south is hardly less than 1950. The surface is estimated at 5,400,000 square miles, according to some authors; whilst others assign to it only 3,600,000 square miles.

Boundaries.—This great difference in the estimates arises from the circumstance that a very large tract of country, the steppe of the Khirghis Cossacks, which is considered to belong to the Russian empire, is not included in any of its political divisions, and that the boundary-line between Siberia and the Chinese empire in some places has not been exactly fixed. As Siberia is surrounded on the east by the Pacific, on the north is washed by the Polar Sea, and has on the west a mountain-range, the boundary line is well determined in these parts. But on the south it borders on the Chinese empire and on the steppe of the Khirghis Cossacks. While the Mandshoos were occupied in conquering China, the Russians had pushed their conquests to the frontiers of their country, and established themselves on the north-western tributaries of the Amur river, which the Mandshoos considered as an encroachment on their territories. This led to some aggressions on the part of the Mandshoos; and at one time it seemed likely that the two greatest sovereigns of their time, the emperor Kang-hi and Peter the Great, would come to blows. But the matter was compromised by the treaty of Nertshinsk (1689), by which the boundary between the Chinese and Russian empires was fixed, and this boundary was confirmed in 1727. According to this treaty the boundary begins on the Pacific east of Tugura or Tugursk Bay, an inlet of the Sea of Okhotzk, between 138° and 139° E. long., and runs southward to the range of mountains called Tugursk, which terminate on the east opposite the most northern part of the island of Saghalien or Tarakaï. This range forms the frontier until it reaches the great chain of the Yablonoi Khrebet, or Khingkhan, of which it is only an offset. The highest part of the last-mentioned range constitutes the boundary-line between the two empires between 132° and 120° E. long. West of 120° E. long. the small river Gorbiza descends from the mountains southward and falls into the Shilka, one of the principal branches of the Amur. [AMUR.] The Gorbiza forms the boundary up to its mouth, and then the Shilka to its confluence with the Argun. The frontier then follows the course of the Argun upwards to its confluence with the Kailar, whence it runs westward in an irregular line, crossing the lake of Khara and the river Onon, one of the branches of the Shilka, until it again joins the Yablonoi Khrebet at the snow-covered summit of Mount Tchokondo. Between the river Gorbiza and Mount Tchokondo a part of Siberia lies to the south of the mountain-range which extends along the northern side of the great table-land of Eastern Asia, and the watercourses of this country run to the Amur. From Mount Tchokondo (between 110° and 111° E. long.) the boundary does not follow the watershed, but runs westward across the basin of the river Selenga, until on the west of that basin it reaches the western extremity of the extensive mountain-range which bears the name of Erghik Targak Taïga [ALTAI MOUNTAINS, vol. i., p. 398], and extends to the banks of the Yenesei (between 93° and 92° E. long.). This wild and nearly uninhabited mountain-range constitutes the boundary between the two empires east of the Yenesei; and west of the river it is formed by the mountains of Sayansk, and more especially that branch of them which extends along the eastern shores of the mountain lake of Teletskoi, or Altyn (89° E. long.). Thus far the boundary between the two empires was fixed by the treaty of Nertshinsk, and in those parts where it is not formed by nearly inaccessible mountains, pillars have been erected to indicate it. The number of these pillars is eighty-seven, and the most western occurs to the east of Lake Teletskoi, at the mountain-pass called Shabina Dabahn. Farther west the boundary between the two empires was not fixed by the treaty. The country south of the Altai Mountains, though at present subject to China, was at that time the independent kingdom of Songaria. [SONGARIA.] The Russian maps carry the boundary as far south as 49° 30′ south of the lake of Teletskoi, but the whole of the country in that part south of 52° N. lat. is inhabited by tribes who pay tribute both to the emperors of China and of Russia. Thus the boundary between 89° and 86° is not determined. Farther west it has not been fixed by treaty, but is formed by the rivers Buchtarma and Narym, both affluents of the Irtish. At the mouth of the Narym the boundary between the two empires terminates.

Between the river Irtish and the Ural Mountains the boundary-line runs through the Caspian desert, and more particularly across the steppe of the Middlo Orda of the Khirghis Cossacks. It is properly formed by the course of the river Irtish as far north as the town of Omsk. At this place the Ishim line of fortifications begins, which extends westward across the steppe to Petropawlovsk on the river Ishim, and to Zwerinogolovsk on the Tobol. It then follows the course of the Tobol to its confluence with the Oüï, and afterwards this tributary of the Tobol to Troitzk and the base of the Ural Mountains. This line of fortifications was erected in the last century to protect the country north of it against the predatory incursions of the Khirghis Cossacks: but since that time the Russian government has acquired some authority over the chiefs of the Middle Orda of the Khirghis Cossacks, and hence the southern boundary of Siberia on the Russian maps extends much farther to the south. From the mouth of the river Narym this line run southward at some distance from the western extremity of Lake Zaizang to Lake Alakul; the greatest part of which lies within the boundary. From this lake it extends westward to Lake Balkatch, which it traverses; and it then turns north, until it meets the mountainous tract which in these parts runs through the steppe east-south-east and west-north-west, and whose most elevated part is known under the name of Oolutau. It follows generally the watershed of this tract to its termination near 68° E. long., and from that point it extends north-north-west to the Ishim line of fortifications, which it joins near to the town of Zverinogolovsk. It then runs along the line to the base of the Ural Mountains.

Surface.—This immense country, which exceeds Europe in extent by about 1,500,000 square miles, offers less variety of surface than perhaps any other portion of the globe of equal extent. The western half of it, or that which lies west of the meridian of the North East Cape (105° E. long.), is one uninterrupted plain, whose surface is in many parts a dead level, in others undulating; but there are hardly any elevations high enough to be called hills, except towards the southern extremity, where the Altai Mountains, and the chains called the Mountains of Suyunsk, and their offsets, rise in many parts above the snow-line. The eastern half, or that which lies east of 105° E. long., contains numerous mountain-ranges and hills, which occupy a great extent of country, between which some plains are enclosed. The mountains in some places rise above the snow-line. The plains are at different elevations above the sea; the southern being perhaps 2000 feet above the sea-level, whilst the most northern are so low that a part of them is inundated during hard gales. To give a more precise notion of the surface, soil, and productions of this country, we shall divide it into three regions, which we shall name Western, Central, and Eastern Siberia. The two first comprehend the country west of 105° E. long., and the last the country east of that meridian.

Western Siberia lies between the Ural Mountains (60° E. long.) and 85° E. long., and the surface consists of one extensive plain, with the exception of the most south-eastern angle, where that portion of the Altai Mountains occurs which is called the Ore Mountains of the Altai, because a great quantity of silver and copper is annually obtained from the mines of this district. According to its productive powers it may be divided into five regions, the steppe, the agricultural district, the mining district, the wooded region, and the northern plain or tundra.

The *Steppe* comprehends the southern part of the plain as far north as 55° N. lat., and extends from the base of the Ural Mountains to the banks of the river Irtish. Along its south-eastern border lies a wide hilly tract, which on the east occupies the whole country between the course of the Irtish from the Chinese frontier to Semipalatinsk and the lake of Balkatch, and hence extends in a west-north-west direction as far west as 68° E. long., surrounding the lake of Koorgaldshin, and approaching the southern banks of the river Ishim, where it flows from east to west. This mountain tract is 300 miles in width, but only the northern portion of it is included in the boundary of Russia. It is not traversed by any continuous range of high mountains, but is interspersed by numerous short ridges, which generally run south and north or south east and north-west. Some of these ridges attain a considerable elevation, as, for instance, the Manatir Tau, west of Oust Kaminogorsk, and the Semitau, south of Semipalatinsk. The latter is about 2000 feet above the sea, and about 1200 feet above its base. The most elevated ridge seems to be the Oolutau, which between 75° and 68° W. constitutes the watershed of the rivers, and lies on the boundary-line of Siberia. In the wide tracts of undulating ground which separate the isolated chains, the soil generally consists of bare rocks without vegetation, and is partly covered with salt incrustations. The rivers have water in the cold season; in the hot season it is only found in a few places. The numerous small lakes have always a bitter or brackish water, and cannot be drunk. The vegetation consists only of artemisiæ, salsolæ, and salicorniæ. Along the watercourses there are a few poplars, but otherwise the country is destitute of trees and shrubs. The more elevated tracts are covered with grass during the greater part of the year. The animals are wild hogs, argalis, saiga antelopes, and the dipus jaculans; the birds are the turdus roseus, sturnus roseus, eagles, falcons, and snipes. But farther south, towards the higher ridge of the Oolutau, the country improves. Wells are more frequent at the foot of the hills, and though the grass grows only in tufts surrounded by a bare red clay, it is tolerably abundant, and affords good pasture for the herds of the Khirghis Cossacks. There are a few tracts fit for agriculture. In one of these tracts, which is more extensive than the rest, the Russians established a colony of agriculturists in 1823. It is called Karkaraly. The mountains are partly covered with pine-trees, and in several places copper-ore abounds. This hilly tract contains the sources of the Ishim, and of the Noora, which rises near Karkaraly, and running in a general north-east direction falls into the lake of Koorgaldshin, which has no outlet; but it is stated that in spring it discharges its waters by a channel into the river Ishim.

This hilly tract is separated from the Ural Mountains by a very level plain, which in these parts is only 300 miles wide, but farther north increases to double that width between 52° and 55°, where it occupies the whole country between the Ural Mountains and the Irtish river. This plain contains an immense number of small lakes, the water of which is brackish. The number of these lakes and the saltness of the water have led to the opinion that they are the remains of an arm of the sea, which at some remote period united the Lake of Aral and the Polar Sea in the direction of these lakes and the lower course of the Oby. The tracts which divide these lakes from one another, and rise a few feet above their level, have a soil consisting of sand or of yellow clay, or of both together, and they support only a scanty vegetation. Many parts are covered with a salt efflorescence as white as snow, and produce several kinds of salicorniæ. The river Ishim runs slowly through a bottom never exceeding a mile in width; and on this narrow tract there are bushes and good pasture. The most fertile tracts lie round the lakes. They are overgrown by rushes and canes of high growth, which serve as firewood; and when it has been cleared away, wheat is sown by the Khirghis Cossacks, and gives good crops. The saiga-antelope and the dipus jaculans, and also wild hogs, are common. A great number of swans and wild geese in their migrations from the northern regions to the Caspian Sea and the Lake of Aral visit the larger of the lakes, and are killed by the Khirghis Cossacks.

As this steppe, which is known by the name of Ishim, is very rarely visited even by the Russians, and then only by caravans, we have no meteorological observations. We know in general only that the summer is very hot, and the winter exceedingly cold; and that the quantity of rain is small, and usually falls at the approach of winter. In that season snow is frequent; but it is not heavy, and therefore the rivers are not well filled even in spring when it melts. In summer the rivers are dry, with the exception of the Ishim, which has always a moderate quantity of water, derived from the most mountainous part of the hilly tract of the steppe, in which it rises, and from which it receives its supplies.

The *Agricultural District* extends north of the steppe, between the Ishim line of fortifications on the south and [illegible] N. lat. Between the rivers Irtish and Oby it advances as far south as 61° N. lat. As this tract is much more than twice as large as the British Islands, comprehending an area of about 280,000 square miles, it would maintain an immense population if the soil were fertile; but, so far as it is known, the soil is of inferior quality. But two hundred years have not yet elapsed since agriculture was introduced into this country; and owing to different reasons, both natural and political, its progress has been very slow. This region presents a great diversity of soil and productions. That part of the country which is contiguous to the Ural Mountains and extends to the western banks of the river Tobol from the Ishim line of fortifications, or from the river Oui to the road which leads over the mountains through Ekaterinebur[illegible] and Toomen to Tobolsk, partakes strongly of the nature of the steppe, and is called the Steppe of Isset, from a river, a tributary of the Tobol, which traverses it from south-west to north-east. The higher country, extending between the watercourses, is nearly a flat, and interspersed with numerous lakes. The surface is covered only with bushes and a scanty grass which grows in tufts; but the declivities of the mountains are overgrown with forests, consisting of several kinds of firs, lime trees, ash, and alder, and numerous rivers descend from their summits. As these rivers are abundantly supplied with water in spring, they have excavated wide bottoms, which are covered with alluvial soil, and are comparatively fertile. Accordingly agriculture and the rearing of cattle are carried on to some extent. The great number of wild geese and swans which twice annually visit the lakes are an important object to the inhabitants of this region.

North of the great road leading from the Ural Mountains to Tubolsk, the whole country, in its natural state, is covered with trees, consisting of different kinds of firs, birch, and willow. These forests, which still cover a large part of the surface, are valuable on account of the numerous mines of iron and copper which are here found on the lower declivities of the Ural Mountains. The places which have been cleared and appropriated to agricultural purposes are in the neighbourhood of the mining establishments, and more extensively along the banks of the Tobol and a few of its affluents.

That part of the agricultural district which lies between the lower course of the Tobol and Irtish is of a similar description. The southern districts, or those which are contiguous to the Ishim line of fortifications, resemble, in some degree, the Steppe of Ishim, except that the number of lakes is still greater, and that of the watercourses much smaller. The soil is drier, and less favourable to vegetation. The cultivable tracts are only those which are in the immediate vicinity of the lakes, and in the narrow bottoms of the Ishim river. Trees occur only in patches. The northern districts are hilly, especially between the Tobol and Ishim; and their soil is not inferior to that on the west of the Tobol. The cleared spots are tolerably numerous, and the crops are sometimes plentiful; but here also a large part of the country is still covered with forests of pine, fir, poplar, and birch. Between the Ishim and Irtish the country is nearly a flat, but somewhat elevated above the watercourses. It approaches to the character of the steppe, as is shown by the numerous lakes and the scarcity of wood. The trees are of less vigorous growth than farther west, and the cultivated spots are few.

These two tracts of the agricultural district are the best cultivated, and probably also the most fertile region of Western Siberia. Agriculture ceases at the base of the Ural Mountains, at Verkhotorie, between 58° and 59° N. lat., and on the banks of the Irtish, at Denshikova, near 60° N. lat. At the first place barley and oats, and at the last mentioned rye and barley, are grown. These grains are also the principal objects of cultivation in the whole country. Wheat is grown only in a few places, especially on the bottom of the Irtish river. Buckwheat and millet are also grown. Flax, hemp, and tobacco are much attended to, as well as peas and beans. The most common vegetables are potatoes, carrots, turnips, cabbage, onions, radishes, mustard, cucumbers, and pumpkins.. In some places water-melons are grown. No fruit-trees succeed. Horses, cattle, sheep, and hogs are numerous: goats are few. The wild animals are bears, wolves, foxes, martens, polecats, lynxes, squirrels, and hares; the saiga-antelope in the steppes; and elks and reindeer along the northern border, where however they are only seen in the spring.

The eastern part of the agricultural district, or that which lies between the Irtish and the Oby, is called the Steppe of Barabinza. It extends over more than one-half of the region, and is only well known where it is traversed by the road that leads from Tobolsk to Tomsk, and to the mining district. The denomination of steppe seems to be applicable only to the southern part of this region, and even here it differs in some degree from the Steppe of Ishim, which is separated from it by the Irtish. The soil, far from being dry and arid, is partly covered with swamps and lakes, several of which are of great extent, as those of Oubinskoi, Chany, and Chebakly: the more elevated tracts are traversed by many small rivers, which contain water all the year round. In most parts the surface is a dead level, and without vegetation; but in isolated spots it is covered with grass, and contains poplar and birch. The more elevated spots are frequently covered with a salt efflorescence, and the water of some of the lakes is brackish, especially those south of 54° N. lat. This tract is not much inhabited, partly owing to the barrenness of the soil, and partly because it is the seat of the Siberian plague, which every summer swept away a large proportion of the inhabitants, until lately, when an easy remedy was discovered. The northern district of the Steppe of Barabinza differs greatly from the southern, being covered with nearly continuous forests of firs and birch, on a very swampy soil. It contains no lakes, but some morasses are of great extent. No agriculture is carried on, but wild animals are numerous, among which the beaver is considered the most valuable by the nomadic tribes that inhabit these forests and live chiefly on the produce of the chase.

The south-eastern angle of the Steppe of Barabinza contains a very remarkable depression, which begins about 20 miles due north of the town of Semipalatinsk, on the Irtish (50° 25′ N. lat.), and extends in a north-north-east direction to the town of Bernaul, on the Oby (53° 20′), a distance of more than 200 miles. The width varies between 20 and 30 miles. The surface of this depression is very swampy, and at the base of the higher country on both sides there is a nearly continuous series of long narrow lakes united by channels that carry the surplus waters to the Oby. The whole tract is covered with fine fir-trees, which are very valuable for the mining operations carried on at Bernaul and in the Altai Mountains. These immense forests are separated from the mountains by an elevated and treeless steppe, which on the south is about 40 miles wide, but towards the north is double that extent. This steppe has a dry soil and no lakes. It is little adapted to cultivation; but the vicinity of the mining district, and the certainty of finding there a ready sale and a good price for their grain, have induced the Russian settlers to cultivate a part of it; and the remainder supplies good pasture for their horses and cattle.

The winters of the agricultural district are much colder than in Russia west of the Ural. This greater degree of cold is probably due to the extensive steppe which lies south of it, and in which the winter is much more severe than in those parts of Europe which are 20 degrees farther north. At Tobolsk the thermometer every winter sinks to −25°, and sometimes to −30°, and it generally does not rise above −20° for four or six weeks together. The summer heat is very great. In July and August the thermometer usually rises to 85°, and even 90° after mid-day; but the nights are rather cold in comparison with other countries in which the daily temperature is as high. Neither rain nor snow appears to be abundant in the plain; but along the base of the Ural Mountains rain is very frequent in the hottest part of the year. According to an average from the observations of ten years, the number of rainy days at Ekaterineburg in the month of July is 16·4.

The *Mining District* extends over the south-eastern part of Western Siberia, and comprehends the most western portion of the Altai Mountains. Under that head [vol. i., pp. 395-397] we have given a sufficiently long account of the character of these mountains, and the means of subsistence that the inhabitants derive from the numerous mines of gold, silver, and copper; from their extensive fisheries in the Irtish river; from the excellent pasture-ground for horses and cattle on the declivities of the mountains; and from agriculture, which is prosecuted on a limited scale in the wide valleys by which the mountain-mass is furrowed.

The *Wooded Region* lies north of 60°, but, properly speaking, the northern portion of the Steppe of Barabinza, as far south as 57°, ought to be included in it, as the general features are similar. It cannot be determined where this region terminates on the north; for in the extensive bottoms of the river Oby, which are about 200 feet below the general surface of the plain to the east of it, trees occur as far north as 66° N. lat. in the vicinity of Obdursk, and the whole country west of the Oby as far north seems to be in no part destitute of forests, which mostly consist of birch, but north of 64° they do not exhibit that vigorous growth by which trees are characterised all over Siberia. On the plain east of the river Oby the woods do not extend beyond 65° N. lat. The surface of this plain is interspersed with numerous gentle elevations. The whole region is covered with pine and fir species, and the birch is also common. No part of it is adapted to agriculture. Erman however mentions some attempts which have been made at Berezow (near 64° N. lat.) to cultivate rye and barley, which have succeeded, and this therefore may be considered the most northern point at which grain is cultivated in Asia. Several vegetables are grown at Berezow. Turnips attain a great size. The scanty population of this region are either settled along the banks of the river, where they gain their subsistence by fishing, or wander about in the forests in quest of the wild animals. Fish is very abundant in the Oby. At the beginning of spring, when the ice of the river has broken up, they ascend from the Polar Sea in immense shoals as far as the confluence of the Tom with the Oby (56° 30′ N. lat). The most common fish are sturgeon, salmon, and herrings. The river fish are chiefly pike and perch. All the fur-bearing animals mentioned in the agricultural district are very numerous here, and there are also polar foxes, gluttons, sables, and ermines. Beavers are common along the Oby, and otters abound in that river. The reindeer and elk are abundant in the woods. The climate in winter is severe, but the heat in summer is very considerable. Erman incidentally mentions, that the mean annual temperature of the summer at Berezow (64° N. lat.) is 59·92°, or hardly three degrees lower than that of London. The mean temperature of June is 57·20°, that of July 56·12°, and that of August 60·44°. It has been proved that barley may be grown in any country whose mean summer temperature is not below 45°, and accordingly we may conclude that the cultivation of that grain will spread to the north as far as this point.

The most northern part of Western Siberia is a low plain, called the Tundra. The surface is nearly a dead level, and quite destitute of trees. Only a few shrubs occur, whose roots do not penetrate the ground, and even these are of stunted growth. Even in summer ice is found only a few inches under the surface. The soil is covered with moss, except in a few places where it is without vegetation. There is a great number of small lakes, generally well stocked with fish. But the wandering tribes which inhabit this country derive their subsistence partly from their large herds of tame and of wild reindeer, and from the sea animals with which the sea abounds along their coasts, especially the morse and seal. The sea is not deep enough to allow whales to approach the coast, but sometimes dead whales are cast on the shore. The fur-bearing animals are white bears and polar foxes. Within this region, to the north of Obdursk (66° N. lat.), on the west of the river Oby, stands an isolated mountain-mass, called the Mountains of Obdursk. It is not connected with the Ural range, which lies farther west, and both extremities sink down with a steep descent to the level country. The upper part of this range is divided into five summits, of which the most elevated attains a height of 4992 feet above the sea-level. This mountain-range is without vegetation.

Central Siberia lies between 85° and 105° E. long., and comprehends the greater part of the Altai Mountains, the hilly country east of the Oby river, as far north as its affluent the Ket, the vale of the Upper Yenesei, the plain of the Lower Angara river, the wooded plain, and the Tundra; in all six regions.

The *Altai Mountains* may be considered as terminating on the north-west at a line drawn from Semipalatinsk in a north-eastern direction to Biisk, situated at the confluence of the Katunga and Biya, by the union of which the Oby is formed, and hence to Koosnesk on the Tom, a tributary of the Oby, and to Atshink on the Choolym, another tributary of the Tom. To the north-east of the last-mentioned place the mountains subside into the plain. All the country south-east of the above line is covered with high mountains, but only that part of this mountain system which lies west of 85° E. long., and which bears the name of the Ore Mountains of the Altai, is tolerably well known. East of 85° E. long., only a few of the larger valleys situated as far east as 87° E. long. have been visited, but of the immense mountain-masses which lie between 87° and 90° E. long. we have no account at all. The wide valleys traversed by the tributaries of the Katunga are nearly covered in their natural state with forests of fine larches, pines, and birch-trees. A few agricultural establishments have been made here, and it is stated that they produce rich crops of wheat and rye, except towards the sources of the larger rivers, where the valleys are high. The Calmucks, who are still in nearly exclusive possession of these mountains, have large herds of horses and cattle, and kill annually a great number of elks, deer, bears, gluttons, wolves, sables, lynxes, foxes, and wildcats, with which the mountains abound. Musk-animals are common, but the wild sheep or argali appears to be rare. The metallic wealth has not yet been explored, though it is supposed that this part of the Altai Mountains contains many minerals.

The country which lies west of the Altai Mountains, and extends to the eastern banks of the river Oby, by which it is separated from the Steppe of Barabinza, differs greatly from the last-mentioned tract. Near the mountains its surface rises into numerous hills, but towards the north it extends in a plain. This plain is slightly undulating between the Oby and its confluent the Tom. It is almost entirely covered with coniferous trees, among which the pinus cembra is numerous: the cones are collected, and constitute an article of commerce with the countries farther west. Cultivation is however limited, the soil of this tract being sandy and of inferior quality. East of the river Tom the country is a table-land, furrowed by numerous rivers which run in a northern and north-western direction, and along the course of which there are many wide bottoms considerably depressed below the surface of the plain. The higher country is overgrown by dense forests of high trees, mostly birch and poplar, and in the bottoms, which are sheltered against the winds, coniferous trees occur, especially larch, firs, and pinus cembra. These bottoms have a fertile soil; cultivation is carried on in them to a considerable extent, and there are numerous villages. The forests along the foot of the mountains are composed of deciduous trees. The river Ket, which divides this region from the forest region, must be considered as the limit of cultivation in this part of Siberia, as no grain is grown beyond Narym, situated near the mouth of that river.

The *Vale of the Yenesei* is considered the warmest part of Siberia. It is perhaps also the most fertile. It is enclosed by mountain-ridges, which sometimes rise above the snow-line. On the west of the vale, between 88° and [illegible] E. long., are the Teletskoi Mountains, so called from the lake of that name, which lies to the west of the range. This chain, which may be considerod as the most eastern of the Altai Mountains properly so called, attains the snow-line between 51° and 52° 30′; but farther north, where it is called the Kemchugk range, it sinks lower down, and is traversed by several roads. Between Atshinsk and Krasnoyarsk, it approaches close to the western and northern banks of the Yenesei, and terminates farther north near the sources of the Ket. On the south of the vale are the Mountains of Sayansk, which unite the Altai Mountains to the range called Erghik Targak Taïga, and separate Siberia from the Chinese empire. This range extends northward to the vicinity of the town of Sayansk, and the river Yenesei makes its way through it by a long and narrow gorge. Many parts of these mountains are always covered with snow. The Erghik Targak Taïga Mountains are properly the eastern continuation of the Mountains of Sayansk, and are very little known. From this elevated mass a range branches off to the north, which is called the Mountains of Sabinsk, and terminates in lofty hills south of the town of Krasnoyarsk, nearly opposite to the Kemchugk range. The low valley which divides these two ranges is about [illegible] miles wide, and constitutes the most northern extremity of the vale. Thus surrounded by mountains, the vale extends about 350 miles from south to north, and nearly 200 from east to west, but perhaps not less than one-half of it is occupied by high mountains. The offsets of the Teletskoi and Sabinsk Mountains also cover a considerable part of the surface. Thus the vale is shortened to about [illegible] miles, and narrowed to perhaps 100 towards the south, and to less than 50 miles towards the north. The Yenesei flows through a wide bottom covered with alluvium from two to three feet thick, and of great fertility. Wheat, rye, and oats yield from ten to twelve times their seed. The higher ground generally extends in a level plain, which in some parts partakes slightly of the nature of a steppe, being intersected here and there by salt lakes, and producing only a few grasses, but by far the greater part of it resembles the best kind of prairies. It is abundantly watered, and the watercourses are fringed with trees, while the remainder is covered with a rich turf of grass all the year round. Some of the bottoms of these rivers are also wide, and might be cultivated, especially that of the Abacan river, but at present they are used as pasture-ground, and herds of cattle are sent from this country to other parts of Siberia. The rearing of cattle is favoured by the mild winters. The cattle remain the whole year round on the pastures, the cold not being intense, and frequently not occurring before Christmas, with the exception of night-frosts. Snow also generally does not fall in such abundance as to prevent the cattle finding food under the snow. On these plains many useful plants grow in a wild state, as the wild hemp, the wild flax, wild Siberian buckwheat, which is collected and used by the inhabitants in making a kind of porridge, and several sorts of *vaccinium* and *ribes*. The mountains which surround the vale are inhabited by some small wandering tribes, who gain their subsistance by the chase. The wild animals in the woods which cover these mountains are bears, wolves, lynxes, gluttons, elk, deer, and wild hogs. There is a kind of wild goat whose skin is much valued all over Siberia. In the Yenesei and some of its confluents there are otters and beavers. Sables also occur, but their skins are less valued than those which are obtained in the countries east of the Yenesei river.

The most eastern part of the southern portion of Central Siberia is the plain of the Lower Angara. It is surrounded on the west by the Sabinsk range, on the south by the Erghik Targak Taïga Mountains, and on the east [Baikalian Mountains] by that branch of the Baikal Mountains which divides the course of the Upper Lena from that of the Lower Angara, and which appears not to be distinguished by a peculiar name. Towards the north the plain opens into the wooded lowlands. The course of the Upper Toonguska, which runs from east to west, may be considered as the northern boundary of the plain, as agriculture does not extend to the north of that river. This extensive country is an inclined plain, which sinks towards the north, and in that direction is traversed by several rivers which run to the Lower Angara and Upper Toonguska. It is also much more elevated than the vale of the Upper Yenesei, as the town of Irkurok is 1240 feet above the level of the sea. It may in this respect be compared with the plains of Northern Switzerland and Bavaria, which extend along the northern base of the Alps, as the Plain of the Angara extends along those of the immense mountain-masses of the Erghik Targak Taiga Mountains. Both plains are between 1100 and 1300 feet above the sea-level. The surface of the plain of the Angara is generally hilly, but in the direction from south to north it is traversed by some extensive valleys which are nearly level. Between the rivers Kan and Tshuna there is an elevated tract which terminates only at a short distance from the confluence of the Upper Toonguska and the Yenesei, and which travellers call a mountain-ridge on account of its elevation above the plain. Other offsets of the Erghik Targak Taiga Mountains are no less elevated, though they do not extend to the road which leads from Krasnoyarsk to Irkutsk, but terminate at some distance south-west of it. The greater part of this elevated region is still covered with forests of larch, fir, and birch, and at intervals there are fields which produce moderate crops. Rye, oats, buckwheat, hemp, and tobacco are cultivated with success. In a few places agriculture extends to the narrow valleys which lie between the offsets of the mountain-ranges, but these parts of the region are still inhabited by some small wandering tribes, who keep no domestic animals except camels, and this seems to be the most northern point of Siberia in which these animals are found. Some of them however have a few horses, cattle, or sheep. They hunt the elk, a large deer called *marali*, the *musmon*, a kind of mountain-goat, lynxes, and especially sables and squirrels, all which animals are plentiful in the large forests of coniferous trees with which the lower declivities of the Erghik Targak Taiga Mountains and their offsets are covered. They use as food the roots of some wild plants. The fruit of the pinus cembra is considered a dainty. Erman states that the mean annual temperature of Irkutsk is only 31·5°, or a little below the freezing-point. The winter is extremely severe, and in some places the quicksilver freezes. But the winter temperature is subject to great changes. The difference between the temperature of the morning and of noon sometimes amounts to 45° (from +10° to −35°). This region is characterised by the dryness of the atmosphere. Erman compares the dark colour of the sky to that of the equinoctial regions. He attributes this dryness of the air to the elevated country which extends south of Irkutsk to the Great Wall of China, a distance exceeding 800 miles, and to the prevalence of southerly winds during January, February, July, August, and November, observing that though during the remaining seven months north-westerly winds prevail, they are far from being so intense as the south-westerly winds. Owing to the dryness of the atmosphere, only a small quantity of snow falls on this region.

North of the courses of the rivers Upper Toonguska and Ket, of which the latter is a confluent of the Oby, lies the *Wooded Region* of Central Siberia, and along the Polar Sea extends the *Tundra*. We are less acquainted with these two regions than with that part of Western Siberia which we have described under the divisions bearing the same name. So far as we know them, they do not appear to differ materially in their character or products. According to information collected by Erman, a mountain-range traverses Siberia on both sides of the Yenesei river from east to west, under the polar circle. No such range is marked on our maps, but the course of the rivers renders its existence probable. Agriculture is only carried on in the valley of the Yenesei river. At Yeneseisk several kinds of grain and vegetables are grown.

Eastern Siberia, or that part of it which lies east of 105° E. long., comprehends about one-half of the whole surface of the country. It contains a much smaller portion of land fit for agricultural purposes than the other divisions, which is partly owing to the severity of the climate, and partly to the greater elevation of its surface in those parts which are south of 60° N. lat.

Along the shores of the Sea of Okhotzk, between the Chinese frontier and the town of Okhotzk, the coast is rocky and very high. The country rises with a steep ascent, and at a short distance from the sea the general level is from 2500 to 3000 feet above it. This may also be considered as the general level of the immense tract which extends westward from the sea south of 60° to the meridian of the town of Yakutsk, and then west-south-west to the northern and eastern shores of the Lake of Baikal, having in this part the vale of the river Lena for its northern boundary. It comprehends therefore nearly the whole of the extensive basins of the rivers Aldan, Olekma, and Vitima, with several smaller basins lying between them. This table-land is very imperfectly known, as only a few tracts contiguous to the large rivers have been visited even by the Russians. According to this scanty information it appears that the surface is a succession of plains, separated from one another by depressions, or by ridges of hills. In some parts where these changes of the surface occur at no great distance from one another, the country assumes a hilly aspect; but it does not appear that the hills ever attain the snow-line, which in these parts seems to occur near 5000 feet above the sea-level. The whole region is entirely unfit for cultivation, and it does not appear that any considerable portion of it is adapted for pasture, as none of the numerous tribes of the Yakutes, who live chiefly on the produce of their herds, have settled on it, but the whole has been abandoned to the Toonguses, who get their subsistence by the chace. The Russians have tried to form settlements on the banks of the larger rivers, but they have always soon abandoned them. The surface is generally covered with trees, consisting chiefly of pines, firs, larch, and pinus cembra intermixed with birches. In some places however there are bare rocks, and in others extensive swamps. The number of lakes is said to be very great, and many of them are surrounded by high hills: these lakes are usually covered with ice nearly the whole year round. The fur-bearing animals of this region are bears, wolves, several kinds of foxes and gluttons, squirrels and sables. The sable is of a very superior quality, particularly that which is taken in the valleys of the rivers Olekma and Vitima. A pair of sable skins sometimes fetches twenty pounds, and a whole fur-coat made of them would be worth 1000 pounds. Squirrels are very abundant, and many millions are annually taken. They are usually of a greyish colour, but many are striped. There is also the flying squirrel, but its skin is of little value. Among the other wild animals are numerous reindeer, and the argali or wild sheep. The climate of this region is distinguished by the severity and the length of the winter.

At the south-western extremity of this region lies the Lake of Baikal. The high mountains by which the northern and eastern sides of the basin are enclosed stand on the edge of the table-land, and the upper valleys of the Upper Angara and Bargoozin in their material features exactly resemble the elevated plain. It is only in the lower and wider portion of their valleys, whose surface is slightly elevated above the level of the lake, which is about 1350 feet above the sea, that cultivation has been attempted with some success; but the inhabitants derive their subsistence mainly from fishing. [Baikal.]

The mountain-range which constitutes the southern edge of the table-land separates the streams which run northward to the river Lena from those which flow southward to the river Amur, and constitutes the boundary-line between Siberia and the Chinese empire as far west as 119° E. long. We are not acquainted with its elevation and character. Farther west, where it is included within Siberia, it does not rise above the snow-line, except perhaps in two or three places. This range is called in Siberia the Yablonoi, or Stanovoï Khrebet, and its most western continuation comes close up to the Lake of Baikal between 52° and 53° N. lat. From this range another branches off at the source of the river Vitima, near 113° E. long., which runs to the south-west, separating the rivers which fall into the Amur from those which run westward to the Selenga. Where this range, which is likewise known by the name of Yablonoï Khrebet, crosses the boundary-line of Siberia, stands the high summit of Mount Tshokondo, which is always covered with snow, and attains 8175 feet above the sea-level. The other parts of this range are free from snow, at least at the end of the summer, but in some places it rises above the line of trees, and may attain an elevation of 6000 feet. This chain divides the southern portion of Eastern Siberia into the basin of the Selenga, which falls into the Lake of Baikal, and that of the Shilka, one of the principal branches of the river Amur.

The *Basin of the river Selenga*, as far as it belongs to Russia, is divided into two portions by the course of the river, which here runs in a general direction from south to north. The larger portion lies east of the river Selenga, and consists of three valleys, which extend from the summit of the Yablonoi Khrebet westward, and open into the valley of the Selenga. The mountain-masses which lie between the valleys are overgrown with larch and fir, and underwood, consisting mostly of a kind of bush-birch (*betula fusca*, Pall.), which, according to Pallas, is peculiar to these mountains. In the valleys, the common birch and willow are most abundant. The upper portion of the valleys is too cold for cultivation; but in the lower part, which is generally from three to four miles wide, agriculture has been attempted with success, and in modern times it has been considerably improved by Polish emigrants, who have been transplanted into this region since 1772. They cultivate wheat, rye, buckwheat, flax, hemp, peas, and water-melons. The wider valley of the river Selenga itself appears in many parts to have an arid dry soil; but it contains good pasture, and in some places the soil is of considerable fertility, and cultivated by Russian families which have been settled there for 150 years. About twelve miles from its mouth, the Selenga enters a level plain of considerable extent, which may be considered as the delta of the river, as it is traversed by four arms into which the river divides on entering the plain. This plain extends for 22 miles on the shores of the Lake of Baikal, above which it is very slightly elevated. It is partly a steppe covered with sand, and producing only indifferent pasture; but some tracts along the watercourses are very fertile and well cultivated. The western portion of the basin of the Selenga, as far as it belongs to Siberia, seems to consist of two mountain ranges, of which the southern lies along the boundary-line of the two empires, and the northern skirts the shores of the Lake of Baikal. These two ranges constitute the eastern extremity of the mountain-region known by the name of Erghik Targak Taïga, and are connected with that range south-west of the western extremity of Lake Baikal. Between the two ranges is a wide plain, which opens on the banks of the Selenga, and serves as a pasture-ground for the numerous herds of horses, cattle, and camels of the Buriates, who are in exclusive possession of that tract. The wooded mountains on the east of the Selenga are haunted by wild beasts, such as bears, gluttons, elks, deer, musk animals, wild hogs, ounces, lynxes, wolves, foxes, hares, sables, squirrels, martens, marmots, and wild goats. The great bearded vulture, and *Falco fulvus*, and *Falco palumbarius*, are trained for the chase. Many sheep and goats are kept, and their skins, especially those of the lambs, constitute an important article of export to China. The climate is characterized by severe cold. Even in June night-frosts are frequent, and in winter the thermometer frequently sinks to −35° of Fahrenheit. The rain is abundant in summer, in which season the Baikal is sometimes for weeks together covered with a dense cold fog, which is not dispersed by winds; in winter the atmosphere is clear and dry, and the quantity of snow that falls is very small.

That portion of Siberia which lies east of the basin of the Selenga, and is drained by the river Shilka and its two principal branches the Ingoda and Onon, is called Da-uria, which is said to signify 'boundary-country,' or 'border.' The level of this country is said to be considerably higher than that of the valley of the Selenga and its tributaries, which on an average may be 1500 feet above the sea-level. Pallas observes that the vegetation of Da-uria differs greatly from that of the remainder of Siberia; and he mentions oak and hazel-nut trees, which are not found in Siberia, except in Da-uria. The whole, with the exception of a comparatively small tract along the south-eastern border, is a mountain-region, traversed by several ridges running south-west and north-east, but nowhere rising to a great elevation. In many parts, especially towards the confluence of the rivers, the mountains subside into hills. Those parts of this hilly region which are contiguous to the Yablonoi Khrebet are well wooded; but in proportion as they recede from that range, the forests disappear, and are replaced by isolated groves of *betula fusca* and poplars, and several kinds of low bushes and shrubs: the dryness of the air, the effect of the vicinity of the Gobi, or Great Desert of Central Asia, influences the vegetation of this tract, and prevents the vigorous growth of trees. The valleys along the course of the rivers are rather flat and open, but most of them are fit for cultivation, especially north of 51° 30′, where all the grains of Europe are grown. The mountains and hills are covered for the greater part of the year with grass, which supplies good pasture. Among the wild animals, Pallas mentions wolves, foxes, tiger-cats, hares, and the argali. The most southern portion of this region, or that which lies south of 51° 30′, between the rivers Onon and Argun, is part of the Gobi, or rather, of that portion of it which is called the Steppe of the Kerlon, from the name of the upper course of the river Argun. [AMUR.] The surface is level, with the exception of numerous depressions, some of which are deep enough to preserve the water collected in them during the winter and spring all the year round, so as to constitute lakes; while others during the hot season are converted into marshes. The water of most of them is salt; and as much salt is collected from the lake of Khara or Terey as is consumed in Da-uria. The soil is sandy, and covered with many plants peculiar to this steppe, among which is the *Stellera chamaejasme*, (Pall.), which here represents the cactus of the deserts of America. The wild animals which are common in this desert are only the dshikketei (*Asinus hemionus*), the Da-urian antelope (*Antelope gutturosa*), and the small hare. Bustards occur in great number. The surface is covered with numerous small stones, among which are jasper, agates, berylls, and topazes. No part of this level country is cultivable. The mountains of this region, especially those which lie between the Onon and Argun, are rich in silver, lead, tin, and zinc, all of which are worked. Though under the same parallel as the basin of the Selenga, and perhaps 500 feet higher above the sea-level, the climate of Da-uria is much less severe. In the beginning of May, when Pallas left the valley of the Selenga, it was still winter there: but as soon as he descended from the Yablonoi Khrebet into the lower country of Da-uria, he found that the spring was considerably advanced, and most of the shrubs and plants were in blossom. But he complains of the sudden changes of temperature in this season, and of the sultry heat of the summer. He considers both as the effect of the vicinity of the Gobi.

The *Upper Vale of the river Lena* is among the agricultural districts of Siberia, corn being grown as far north as the town of Yakutsk, according to Erman. The upper part of this valley is narrow, but it grows wider at R[illegible], some distance above Ust Kulsk, and still wider at Olekminsk, and near Yakutsk. In all this extent steep hills enclose the valley on the right, and therefore nearly all the villages and settlements are on the left bank of the river. Though the cultivation of corn and several vegetables generally succeeds in this vale, still the greater part of it is covered with fir and pine trees; whilst the numerous islands and the low banks of the river are overgrown with birch, poplar, and willow. The wooded country is used as pasture by the Yakutes. The country round the town of Yakutsk may be considered as the richest pastoral tract in Eastern Siberia, though the ground is always frozen for a depth of 400 feet below the surface, and only a small layer of 2 or 3 feet is free from ice in summer. Its wealth is chiefly derived from the almost innumerable herds of cattle which pasture on the low country which extends from the river eastward to the river Aldan, where it runs south and north along the southern declivity of the elevated table-land which extends farther north. This tract, which is 300 miles from east to west, and perhaps 200 from south to north, is hilly, but no part of it is more than 750 feet above the sea, whilst many tracts are only 200 feet; the town of Yakutsk is 282 feet. The forests are distinguished by the vigorous growth of the trees, and the pastures are rich. A still more extensive tract of rich pasture-land lies to the east of the Lena river, on both sides of the river Vilui. Many rich families of the Yakutes, who inhabit this tract, possess several hundred head of cattle. It does not appear that any attempt has been made to introduce cultivation on the banks of the Vilui river, though grain is grown at Amginsk, in the tract east of Yakutsk.

The whole country east of the middle course of the river Aldan, between 59° and 60°, is a mountain-tract, extending more than 200 miles east and west to the vicinity of the Pacific. The most elevated part of it, which lies nearly in the middle, and is almost 100 miles wide, is more than 2400 feet above the sea-level. It connects the elevated table-land which stretches southward to the boundary-line of the Chinese empire, with the mountain-ranges that occupy the north-eastern portion of Siberia, and is known by the name of the Aldan Mountains. The whole is covered with fir and larch trees, except the more elevated summits, which attain more than 3000 feet, and which do not appear to be numerous. In the highest parts the *Pinus cembra humistrata* is common. In this region all the animals occur which have been enumerated as inhabiting the forests of the elevated table-land, but the skin of the sables is less valued. The Toonguses, a wandering tribe of hunters, inhabit this country.

In proceeding to the northern part of Eastern Siberia, we must first observe, that the tract which extends between 105° E. long. on the west, and the river Lena on the east, and lies north of the basin of the Vilui river, is very little known, and is nearly a blank on our maps; but it is stated that there are some rich pastures, especially on the banks of the upper course of the river Olenek; and this is probable, as the Yakutes have taken possession of it, a nation which is almost entirely devoted to the rearing of cattle, or the keeping of reindeer where the pastures are not fit for cattle. In these parts a mountain-range appears to traverse Siberia from east-south-east to west-north-west; and it is probably the same chain which occurs on the banks of the river Yenesei near the polar circle, where it is broken through by that river.

At the northern extremity of the Aldan Mountains (62° N. lat., and 141° E. long.) is a mountain-knot from which two chains branch off. One of them runs from this point first due east, and then north-east, parallel to the shores of the sea of Okhotzk and the bay of Penginsk. It is called by the Russians Stanavoi Khrebet, and covers two degrees of latitude in width; but some of its branches reach as far north as 67° N. lat. This chain, as far as is known, does not rise above the snow-line; but as the upper part is destitute of trees and shrubs, with which other chains in this latitude are generally covered, it must attain a considerable elevation. At the source of the river Anadir (near 164° E. long.) it divides into two branches. One of them runs first south-east, and then turns south, traversing the peninsula of Kamtchatka [KAMTCHATKA]; the other extends first towards the north, and then turns eastward, in which direction it terminates at Behring's Strait in the capes Vostostchinii Noss, or East Cape, and Tshookotskoï Noss. This last-mentioned chain is very little known, being included in the territories possessed by the Tshooktshes, who do not permit strangers to enter their country, and are not dependent on the Russian government.

The other chain which branches off from the mountain-knot of the Aldan range at first runs north-north-west, but turns west near 64° N. lat., and continues in that direction, parallel to the lower course of the river Aldan, until it approaches the banks of the Lena, where it turns due north, and terminates near 67° N. lat. That part of the range which lies east and west is called by the Russians the Mountains of Verkhow Yansk; but the most northern portion, which divides the basin of the Lower Lena from that of the river Yana, bears the name of the Orulgansk chain. The Verkhow Yansk chain, where it is traversed by the road leading from the Aldan to the Yana river, is about 2250 feet above the sea; but the highest part of the range is about 800 feet more. This chain, according to Wrangel, constitutes a remarkable line for the vegetation of trees. Pines and firs, which, south of it, are the most common forest-trees, cease to grow at its southern declivity, and also the mountain-ash. North of it only larch, birch, poplar, and willow are found; and those trees occur as far north as 66° on the banks of the rivers, though near the last mentioned parallel they appear only as bushes. The Verkhow Yansk mountains occupy more than 100 miles in width from south to north, and are very rugged, though mostly covered with trees. They are uninhabited, as well as the country which lies south of them, as far as the banks of the Aldan, and north as far as 66° N. lat. This desert tract is called the Tukulan Wilderness, from a river of that name which falls into the Aldan. The lower part of this region, which lies south and north of the mountains, is a nearly level plain, without a tree, whose surface is covered with interminable morasses. A scanty grass occurs only in some more elevated spots.

North of this waste the country between the Lena and Kolyma improves considerably. It is traversed from south to north by several chains of hills, generally of small elevation, but in many places of considerable width. These hills are overgrown with birch and larch, but the trees do not attain their full growth. The greater part of this region is a level plain, without trees, but interspersed with numerous lakes, which contain plenty of fish, and have good pastures on their banks where the settlements of the Yakutes are. The *albuty*, or dry lakes, which constitute a peculiar feature of Northern Siberia, are still more fertile. They are wide and flat valleys, very little depressed below the general surface of the plain. In spring, when the rivers inundate the adjacent country, they are filled with water, which remains there during the summer; but during the winter the ground bursts, and many narrow clefts are formed, by which the water runs off, and in the following summer the whole ground is covered with the finest turf. There are also good pastures near the declivities of the hills, but the remainder of the plain is chiefly covered with moss and is swampy. There are also some wastes of considerable extent, as the swamps, called *badarany*, which occupy nearly the whole tract between the river Indighirka on the west, and the river Alaseï on the east. These are plains covered with moss, on which only a few larches creep along the ground. The surface is wet and swampy all the year round; the number of lakes is very small; running watercourses are entirely wanting; and as there is no grass, this tract is entirely uninhabited. It extends from west to east about 100 miles; but towards the south and north its extent is not known. Along the Polar Sea, and some distance from it, the country is a tundra, or low plain covered with moss, of the same description as that which occurs in Western Siberia. But between the Indighirka and Kolyma the surface is far from being a level. It is traversed by numerous low swells, which generally run south and north, and, terminating on the sea in bluffs, render the coast alternately high and low. The scanty population of this tract subsist almost entirely on the produce of their fisheries in the numerous lakes with which this country is interspersed. Of wild fur-bearing animals only the white bears and the polar fox are common. Their furs, and the elephant bones, which are very abundant, are articles of commerce.

The country east of the Kolyma river is of a different description. The offsets of the Stanovóy Mountains come close up to the river, forming on its banks steep bluffs several hundred feet high, and the whole region is covered with ranges of mountains, frequently rising to 2000 and 3000 feet above the sea. In many places they reach the sea, forming on the shores several elevated capes, as Cape Baranov, Cape Shelagskoï, and North Cape. On the sea-shore however there are many tracts of level ground covered with moss. In the interior the valleys are rather wide, and generally swampy, but also often covered with good pastures. As far as this mountain-region is exposed to the strong north-western gales, it is destitute even of shrubs, but the valleys which are sheltered against the winds are covered with birch, poplar, willows, and the Pinus cembra humistrata, which also frequently occur on the lower declivities of the mountains. The underwood in these forests consists of several shrubs that bear berries. These forests are abundantly stocked with animals. The number of wild reindeer is immense. Elks, argalis or wild sheep, black bears, foxes, sables, and squirrels are very numerous. Polar foxes and wolves are also abundant on the woodless tracts along the coast. The common crow, the snow-bird, the falco melanaetus, and strix nyctea are met with all the year round. Many other kinds of birds come to this country in May, especially swans, in great numbers, four species of wild geese, and eleven species of wild ducks. The animals supply the scanty population with some articles of commerce, and partly also the means of subsistence. But the chief supply of food is from the fisheries in the rivers. The most common fish is the herring; but there is also salmon of several kinds.

The country of the Tshooktshes, or the most north-eastern portion of the Asiatic continent, presents a succession of sterile valleys and bare rocks, whose vegetation is limited to that kind of moss which is the food of the reindeer. In a few sheltered valleys there are some willows which attain the size of shrubs. The climate is extremely severe. Signs of summer are scarcely perceptible before the 20th of July, and on the 20th of August the signs of winter re-appear in the falling of snow and night-frosts. In some parts the rocky masses attain a considerable elevation, and on some of their highest summits, as well as in some narrow valleys, snow lies all the year round. The valleys are generally swampy and full of small lakes. There are a few berry-bearing shrubs. Along the coast, morses, sea-lions, and seals are common; and on the continent, rein-deer, argalis, white wolves, black bears, and the common and the Polar fox. A few families of the Tshooktshes subsist by fishing and killing the sea animals; but the greater number live on the produce of their herds of tame reindeer, and by hunting those which are in a wild state. South of the country of the Tshooktshes is the peninsula of Kamtchatka.

We shall conclude this survey of Siberia with a few observations on the Polar Sea, which constitutes its northern boundary. Nearly opposite the middle of the coast-line of Siberia, or more precisely, opposite the country between the mouths of the rivers Yana and Indighirka, is a group of islands, which are called, from their discoverer, the Liakehoff Islands. They consist of four larger and some smaller islands. The most southern of the larger islands, called Liakehoff Island, is hardly thirty-five miles from Sviatoï Noss, and lies between 73° and 74° N. lat., and between 140° and 143° E. long. It is the smallest of the larger islands, and hardly more than forty miles long from south-west to north-east. Farther north, between 74° 30′ and 76° 10′, lie the three other islands, in an eastern and western direction. They are named, from west to east, Kotelnoï, Fadeyefskoi, and New Siberia. The largest, Kotelnoï, is above 100 miles long from south to north, and about 60 miles broad in the widest part. The two others are about half that size. They do not rise to a great height. Towards the south they have a gentle slope, but on the northern shore they terminate in precipices. Even the summers on these islands are so cold that the snow does not entirely melt, and not a blade of grass grows. They consist of layers of ice, alternating with layers of sand, in which an incredible number of elephant's and other fossil bones are imbedded. Though these bones are annually carried off in great quantities, no diminution is perceptible. It is even stated, that after hard gales a great number of these bones are cast on the shores of the islands, which has led to the conjecture that the bottom of the surrounding sea is of similar composition to the islands. On the southern coast drift-wood occurs in great quantities, and in one place so many trunks of trees have been heaped together, as to form along the shore hills twenty fathoms high, and about three miles long. No drift-wood is found along the northern coast. There are some small rivers in the islands, but as they are never free from ice, the sea-fish do not enter them, and they contain only one kind of small fish, the *gasterotus aculeatus*.

The sea between these islands and the continent does not completely freeze before the last days of October, but along the coast of Siberia the ice is formed much earlier in the year, and soon acquires a degree of firmness. On the contrary, in spring the ice melts much sooner along the coast, which is quite free from it in the month of June, whilst in the open sea it constitutes one unbroken sheet of ice up to the month of July. Even then it would not break if it were not split by the hard frost of the preceding winter. The quantity of ice however is hardly perceptibly diminished even towards the end of the summer. It floats about in the sea in large masses, which, being impelled by currents and winds, are driven against one another with incredible force. These floating masses render the navigation of the Polar Sea extremely dangerous. Vessels sent by the Russian government for the purpose of surveying the coast have frequently been unable to execute the commission; and though this object has been pursued with zeal and skill by able seamen at different times, there is still a tract of coast which has never been surveyed: this tract encloses the most northern cape of Siberia, called the North-east Cape, or Severo Vostotchinii Noss. Nor have the various modern attempts to reach Behring's Strait from the mouth of the river Kolyma succeeded, though it is on record that such a voyage was executed by Dashneff in 1648. Cook, in his last voyage, after passing through Behring's Strait, advanced as far as North Cape, 180° E. long., but found that the masses of ice extended from the coast of Siberia to those of America without interruption. The difficulties and dangers with which all such attempts of discovery and survey were attended, suggested the idea of carrying them into effect by means of *nartes*, or sledges drawn by dogs. Such expeditions are generally undertaken in the latter part of the winter, from March to the end of May, when the cold is much less severe than in the earlier part of the winter. It has thus been ascertained that in winter the large body of the sea is open and free from masses of ice, but the open water occurs in different parts, at different distances from the shore. North of the islands of Kotelnoï and New Siberia, it occurs at a distance of less than twenty miles. Farther east it appears to approach nearer to the continent. Near 165° E. long. it is about 170 miles distant from the shore. Between 175° and 180°, opposite Cape Yacan, it is stated that it approaches within less than four miles; but farther east it is much more remote. In the western parts of the open sea the tides are perceptible, but not in the eastern. Hence it is concluded that there must be a communication with the sea which surrounds the northern parts of Europe. The currents in the Polar Sea run in summer from east to west, and in autumn in the opposite direction.

The expeditions on the ice of the Polar Sea have been obstructed by many difficulties, of which the chief have been produced by the numerous ice-hills, or *torosey*, which are dispersed over the ice. They sometimes constitute single masses with steep declivities: at other times they form regular groups; and frequently they form long ridges. They consist of masses of ice irregularly united, but as the hollow places are filled up with snow, they appear to have a regular form. They vary in height from ten to seventy feet, and are certainly of a different origin from the ice-bergs of the Greenland Sea. Salt is found on the ice wherever it is not covered with a thick layer of snow. Wrangel thinks that it has remained on the surface ever since the sea-water was changed into ice by freezing. In the neighbourhood of the open sea, he says, it is so abundant as to have penetrated the ice to the depth of five inches. It is in the form of small shot, and it has a somewhat bitter taste, but may be used. The persons who annually visit the Liakehoff islands, use it without the least inconvenience. This sea-salt, called rassól, very much retards the progress of the nartes on the ice.

Climate.—Siberia is the coldest country in the northern hemisphere, if we except Greenland and the Arctic Archipelago of North America. It is much colder than any part of Europe situated in the same latitude. North Cape, in Europe, is near 71° 10′, and Ustyansk, at the mouth of the river Yana, in 70° 55′ N. lat. The latter place however is nearly twenty-eight degrees colder, as the following table shows:—

	Mean ann. Temperature	Mean Tem. of Winter.	Mean Tem. of Spring.	Mean Tem. of Summer.	Mean Tem. of Autumn
North Cape	+ 32°	+ 24°	+ 30°	+ 42°	+ 32°
Ustyansk	+ 4·39°	— 24·9°	+ 27·01°	+ 40·15°	— 24

Irkutsk is only about 45′ nearer the pole than London, and yet the mean annual temperature is lower than that of North Cape, being 31°; while the mean annual temperature of London exceeds 50°. But Irkutsk is 1240 feet above the sea-level. This elevation however would lower its temperature only three or four degrees.

The climate increases in severity as we proceed from west to east. The causes of this remarkable phenomenon seem to be very complicated. The cold in the eastern districts is somewhat increased by the mountainous nature of the country east of the Yenesei river, and by the extensive and elevated tracts which divide it from the Pacific, and prevent the temperature of the sea from exercising its influence on the climate of these regions. These two circumstances however do not seem sufficient to explain the great difference which exists between the climate of the western and eastern districts. In Western Siberia the winter, though much less cold than in the eastern districts, is still very severe, and this is mainly to be accounted for by its contiguity to the Great Caspian Desert, where in winter an excessive degree of cold is generated by causes which are not yet sufficiently understood. But as this extraordinary region is subject in summer to excessive heat, Western Siberia experiences the effect in its warm and sultry summers. As a fact, clearly proving the greater severity of the winter in Eastern Siberia, we may observe that quicksilver does not freeze in Western Siberia every year, except in very high latitudes; but it would appear that this is the case every winter in the country near Irkutsk, and it is certain that in Yakutsk it remains in a frozen state for two months together even in mild winters, and in severe seasons for three months.

In a large part of Siberia the ground is frozen to a considerable depth, even at the end of the summer. This occurs also in the most north-eastern corner of Europe, between the Petchora and the Gulf of Kara, where the ground is never free from ice at a certain distance from the surface. On the river Oby the ground is certainly frozen at Berezow, in 64° N. lat.; and Humboldt found at Bogoslowsk (59° 45′) small pieces of ice at the depth of six feet in summer. Bogoslowsk is situated near the base of the Ural Mountains, and, according to Erman, is 876 feet above the sea. Ice is frequently found near Tobolsk at some depth in summer, but rarely in autumn, and it has not yet been ascertained if permanent ice exists under the surface in the vicinity of that town. Farther east this frozen soil extends much more to the south. Georgi found the ground of the country surrounding the Lake of Baikal frozen all through the year; and it seems that in the south-eastern angle of Siberia this phenomenon is observed, even in those countries which are south of the Yablonoï Khrebet. In the environs of Nertshinsk, even on the banks of the Argun river, a frozen stratum about six feet in thickness has been found. This phenomenon was first observed at Yakutsk, in an attempt made to dig a well. It is now known that in that place the frozen stratum extends to the depth of 400 feet below the surface. This frozen state of the ground however does not prevent vegetation, and most of the countries in which it occurs, whose surface thaws in summer to the depth of four or six feet, are covered with large trees. Where however the summer heat is only sufficient to thaw the ground to the depth of a few inches, which is the case in the more northern districts, the roots of the trees extend along the surface, and the trees are low and stunted. Erman did not find the ground frozen at Okhotzk, which is evidently owing to the influence of the sea.

We are unable to give a more exact account of the different regions of Siberia for want of meteorological observations. Erman brought back from his travels such observations, continued for many years at Ekaterineburg, Tobolsk, Berezow, Irkutsk, and Yakutsk, but as he has not yet published them, we shall only add the temperature of two other places, of Bernaul and of Nishnei Kolymsk, of which the former may be considered one of the warmest, and the latter one of the coldest places in Siberia. Bernaul is in 53° 20′ N. lat. and 84° 10′ E. long., and Nishnei Kolymsk in 68° 31′ N. lat. and 160° 56′ E. long. Bernaul is 390 feet above the sea; Nishnei Kolymsk is almost on a level with the sea:—

	Mean ann. Temp.	Mean Temp. of Winter.	Mean Temp. of Spring.	Mean Temp. of Summer.	Mean Temp. of Autumn.
Bernaul	+ 35·13°	+ 6·61°	+ 42·92°	+ 61·82°	+ 29·18°
Nishnei-Kolymsk	+ 12·05°	− 19·03°	+ 36·15°	+ 44·41°	− 13·33°

From this table it appears that Nishnei Kolymsk is much warmer than Ustyansk, which is nearly two degrees and a half farther north. Wrangel, who passed three years at Nishnei Kolymsk, gives a description of the climate of that place. The year is divided into two seasons, the winter and the summer. The river is covered with ice in the beginning of September, and is not free from it before the beginning of June. In October the cold is diminished by thick fogs and the vapours which rise from the sea, which then begins to freeze. In November the frost increases, and it attains its greatest degree of severity in January, when the thermometer sinks to −64°. Respiration then becomes difficult, and the wild reindeer, the true inhabitant of the polar regions, hides itself in the thickest parts of the forests, and stands motionless. In February the cold does not decrease much; in March it begins to decrease more; but the cold which in these months is felt at sunrise is unusually severe to the feelings. Fine days are very rare during the winter, for the prevailing winds, blowing from the sea, carry with them fogs and vapours, which cover the deep blue sky, and the stars cannot be seen. The greatest number of fine days occur at the beginning of the winter, in September. The wind which is called the hot wind blows from east-south-east, and raises the temperature suddenly from between − 45° and − 50° to + 29° and upwards, but it generally does not last more than 24 hours. Towards the end of March, the effect of the heat produced by the sun's rays begins to be perceptible at noon on the snow, but during this time the thermometer at night sinks to − 35°. A sudden rise of the thermometer takes place during the month of June. It sometimes attains + 72·50° at noon. The few plants which grow in this cold climate seem then to vegetate with vigour and to open their blossoms, when suddenly a blast from the sea brings an air charged with a great degree of cold, and destroys the vegetation. In July the heat is greatest, and the weather more constant, but there are innumerable swarms of gnats, which torment men and animals. These gnats however furnish the inhabitants with one of the most important means of procuring food for the winter. They compel the numerous herds of reindeer to leave the forests, and to retire to the treeless country on the shores of the sea. During these migrations, a vast number of these animals are killed by the natives. In August the heat decreases rapidly, and night-frosts are frequent towards the end of that month.

Rivers.—Siberia has a great number of rivers, and as the whole course of most of them, and the greatest part of the course of the remainder, lies through a level and hilly country, nearly all of them are navigable for a great distance. The principal rivers run from south to north, from the agricultural districts to those where vegetation does not supply food to the inhabitants, and hence their great importance for internal intercourse. The tributaries, at least the greater number and the largest of them, run chiefly east and west, and form a water-communication between the agricultural districts themselves, and render it practicable for goods bought from the Chinese at Maimatshin to be transported to European Russia at nearly the same expense as those which are obtained at Canton are carried to Great Britain. Though all these rivers are frozen for more than six months of the year, the advantages arising from them are not thereby materially diminished, as the ice facilitates communication almost as much as the open water.

The *Oby*, *Obi*, or *Ob*, the most western of the larger rivers of Siberia, is the largest river of the Old Continent, not so much in respect of its length as the great extent of country which is drained by it and its numerous affluents. Its basin is said to comprehend more than 1,370,000 square miles, and is only inferior to that of the Amazonas and Plata in South America. [RIVERS, vol. xx., p. 28.] This basin extends from 47° to 74° N. lat., 1890 miles in length, and in the widest part, near 55° N. lat., it is nearly 1200 miles across. The principal branch of the Obi is properly the Irtish, or the western of the two great branches which unite near 60° 20′ N. lat., but the eastern branch has the name of Obi before their union, and is therefore considered the principal river, though it is inferior to the Irtish in length of course. The Irtish rises in the Chinese empire, in the government of Gobdo, or the country of the Western Khalkas Mongols, probably between 46° and 47° N. lat. and 87° and 88° E. long. Its sources have never been visited by Europeans, but it is stated that seven small rivers descend from the ranges of the Altai Mountains, which traverse this part of Asia, and unite as soon as they reach the plain in which the Lake Zaizang is situated. After the union of these seven streams, the river is called Ertish by the Mongols, from which the Russians have made Irtish. The river runs nearly due west, and after about 70 miles falls into the lake of Zaizang. It is certain that this part of the Irtish is navigable, as a Russian expedition ascended it to a considerable distance above the lake in large river boats, and as the Russian fishermen now annually go some miles above its influx into the lake. The Irtish issues from the north side of the lake, several miles from its western extremity. The lake, according to Humboldt, is about 1720 feet above the sea-level. The course of the river is nearly due north, and in a flat country, until it approaches the boundary-line of Siberia, where the mountains come close up to the river on both sides. It then turns to the west-north-west, and in that direction it runs in a narrow valley between rocky hills until it reaches Ust Kamenogorsk. The current in this part is rapid, and at Ust Kamenogorsk the surface of the river is not more than 1311 feet above the sea. It is however navigated, and though not without difficulty, yet with safety. Several considerable tributaries join the Irtish on the right, among which the Buchtarma is the largest, and is navigable to some distance from its mouth. Below Ust Kamenogorsk the mountains withdraw from the left banks of the river, but the Altai Mountains continue to accompany its course to the vicinity of Semipalatinsk. From Ust Kamenogorsk to Semiyarsk the river runs nearly due west, and its course is rather gentle, for at Semipalatinsk the surface is still 1151 feet above the sea. Below Semipalatinsk the Irtish flows through the plain of Western Siberia, and below Semiyarsk turns north-west, in which direction it continues to run to some miles below the town of Omsk, north of 55° N. lat. After the river has left the mountains, it is not joined by any considerable stream except the Om, which drains a part of the Steppe of Barabinza, and is not navigated. Below Omsk the Irtish turns first to the north-east, then to the north, and afterwards it runs again nearly due west to its confluence with the Tobol at Tobolsk. Before this union, the Irtish is joined from the south by the river Ishim, which runs more than 700 miles, but, draining a sterile and sandy country, contains very little water in proportion to its length, and is only navigated in the lower part of its course. The Tobol, which is nearly equal in length to the Ishim, is much more important. It rises near 52° N. lat. and 60° E. long., on a flat swell of the Caucasian Desert, and runs for a short distance to the east, but the remainder of its course is to the east of north, through a level country, though in some places low offsets of the Ural Mountains approach the western banks. No river falls into the Tobol from the right, but it receives several considerable affluents from the left, among which the Ooï, the Isset, the Toora, and Towda are the largest. The Ooï joins the Tobol where the latter enters Siberia, and by this union the river becomes navigable at Ust Ooïsk. In spring, when the river rises from one to two fathoms above its ordinary level, it is navigated by barges of from 200 to 250 tons; but in summer the vessels which navigate it carry only from 20 to 40 tons. The three other affluents of the Tobol above mentioned are also navigable for some distance for small craft. At the confluence of the Tobol the Irtish changes its direction to the north-north-east, but turns to the north-north-west before it meets the Obi.

The Obi rises in the Altai Mountains with two large branches, the Katunga and the Biya. The most remote branch of the Katunga, the Choova, and that of the Biya, the Choolyshman, originate near 49° N. lat., within the Chinese government of Gobdo. Nearly all the waters collected within the Altai Mountains north of 49° N. lat. and between 84° 30′ and 90° E. long. run either east or west, and uniting between 50° and 51° N. lat. near the meridian of 87° E. long., form a large river, the Katunga. After the union of ,these rivers, the Katunga runs nearly due north with an extremely rapid course through the northern ridges of the Altai Mountains, until it reaches 52° 30′ N. lat., when it turns west, and entering a hilly region meets the other great branch of the Obi, the Biya. The Katunga is too rapid to be navigable. The place where the Biya, or Choolyshman, as it is called in the upper part of its course, originates, is not known, and we are very imperfectly acquainted with the course of this river above the lake of Teletskoi. It drains that country, which may be equally claimed by the Chinese and Russian governments, as it is inhabited by tribes who pay tribute to both emperors. The Choolyshman falls into the lake of Teletskoi near 51° 40′ N. lat. with several arms. This lake, called also Altyn-kul or Altai Noor, is a true Alpine lake, resembling in grandeur and beauty the Lake of Luzern. It is surrounded by wooded mountains, rising in the vicinity of the lake to the height of 4000 or 5000 feet, and Mount Toulak at its southern extremity attains an elevation exceeding 6000 feet. The mountains are so near the banks of the lake that no road can be made along them. The lake is more than 40 miles from south-south-east to north-north-west, but at its northern extremity an arm runs westward for 20 miles more. At the southern extremity it is about five miles wide, but it grows gradually narrower as it advances towards the north. The western arm is hardly a mile wide on an average. The lake is about 1900 feet above the sea-level. The river issuing from the western arm of the lake, under the name of Biya, in a western direction, soon turns to the north, but by degrees it resumes its western course, running between mountains and high hills, until it joins the Katunga below Biisk, at Katunsk. After this union the river is called Obi, or Ob. The Biya is too rapid for navigation. The Obi flows in a western direction until it is met from the south by the river Charysh, a considerable affluent from the western regions of the Altai Mountains, which, though not rapid, is unfit for navigation, owing to the numerous shoals and the small quantity of water during the greater part of the year. At the confluence of the Charysh the Obi turns to the north, in which direction it continues, with many windings to its confluence with the Tom, when it begins to run north-west until it reaches 75° E. long., from which place it flows west to its junction with the Irtish. Below the mouth of the Charysh the Obi is joined from the east by three rivers, which are navigable and important for the industry of Siberia even in its present state. The most southern of them is the Tom, which rises in the mountains north of the lake of Teletskoi under the name of Miussa, and runs north and north-west. It begins to be navigable at the town of Kooznesk, and falls into the Obi about 30 miles below Tomsk. The second navigable affluent of the Obi is the Choolym, which rises in the eastern declivity of the mountains of Kooznesk, the prolongation of the mountains of Teletskoi, with two branches, called the White and Black Yioos, which run north-eastward, and after uniting turn to the east until the river approaches within a few miles the western bank of the Yenesei, when it turns north, and having run about 80 miles in that direction, encircles, by a large bend to the westward, the Kemchugh range. It again flows north, but turns to the west, in which direction it continues to its confluence with the Obi. The Choolym becomes navigable at a place called Legostargewa, where it turns north, after the union of its upper branches. The third navigable affluent of the Obi is the Ket, which rises near the most northern extremity of the Kemchugk range, and running in a general western direction reaches the Obi with several arms, the most northern of which falls into that river near Narym. The Ket is navigable to a short distance from its source. The current of the Obi below Katunsk is very gentle, and does not offer the least obstruction to an easy navigation, but in approaching the Irtish it spreads its waters over a low country, and divides into many arms, which enclose large islands, and in this part shoals are numerous.

The Obi, after its confluence with the Irtish, turns northward and flows in that direction to the vicinity of the polar circle, when, increasing to a great width, it turns east at Obdursk, and falls into the Gulf of Obi by three arms, of which the eastern is the largest and deepest. Where the Obi joins the Irtish it divides into two arms, of which the western is called Beresowskye Protok, or Birch River. The two arms unite more than 70 miles farther north, and enclose an island of that length and of a width varying in general from five to six miles. Farther north the river frequently divides again, as the alluvial and low plain which lies to the west of the river is from 40 to 50 miles wide, and the greater part of it is inundated in spring time. The gulf into which the Obi falls is between 70 and 80 miles wide and more than 400 miles long. Except several low islands which occur near the mouths of the river, only a few rocky islets appear, not far from the eastern shores of the gulf, but the gulf itself is so full of shoals, that large vessels find the navigation very difficult. At Tobolsk the Obi generally freezes about the 2nd of November, and at Obdursk in the middle of October. At the first place the ice generally breaks up at the end of April, and at the second not before the middle of May. The gulf is frozen till the beginning of June.

There is certainly no other river that falls into the ocean in which so much fish is taken as in the Obi. According to an estimate of Erman, the quantity of fish consumed within the government of Tobolsk cannot be less than 1,300,000 hundredweight, and is probably much more. The fish taken in the Obi are not all consumed in Siberia, but considerable quantities are sent to the countries west of the Ural Mountains, especially to the mining districts of the government of Perm. The fish taken in the Obi ascend the river in spring from the Polar Sea. But another considerable fishery is carried on in the Upper Irtish, and the fish which are taken there seem to come from the lake of Zaizang. The best places for this fishery are really situated within the Chinese empire, but it is carried on by Russian fishermen, with the connivance of the Chinese authorities.

Some kinds of fish are taken here which are not found in the Obi, as the sterlet and the river salmon. Others are common to both rivers, as the sturgeon and the *Salmo nelma*. It is stated that the number of sturgeon annually taken in the Irtish amounts to 3000, and that of the sterlets to 30,000. The fish are mostly salted or dried. Isinglass and caviar are prepared from them. Most of the fish that are taken in the Irtish are consumed in the mining districts of the Altai Mountains.

The *Yeneseï* is the second river of Siberia in magnitude. It may even be considered the first, if the length of course only is taken into account, and if the Selenga is considered as the principal branch. In that case the course of the Yeneseï exceeds 2500 miles, while that of the Obi falls short of 2400 miles. But the basin of the Yeneseï is much less extensive, as it covers only an area of 1,020,000 square miles, and is inferior to that of the Mississippi in North America. [RIVERS.] The two remotest branches of the Yeneseï, the Ta-kem and Selenga, originate in the Chinese empire. Kem is the name by which the Yeneseï is known to the Chinese. The western branch is called by them Ta-kem. It rises where the two vast mountain-chains of the Erghik Targak Taïga and the Tangnu Oöla Mountains [ALTAI MOUNTAINS, vol. i., p. 398] meet one another, and send numerous streams westward into the valley which lies between them. Among these streams two are named as the branches of the Ta-kem, viz. the Bei-kem and the Khua-kem. After running more than 100 miles south-west and west, they unite and form the Ta-kem, or Great Kem. This river continues to run more than 100 miles westward, when it is met by its first great tributary the Kemtshik, or Little Kem, which rises more than 100 miles farther west, as it is supposed, near the sources of the Choolyshman or Biya; but our knowledge of this part of the course of the Yeneseï is very imperfect. After the union of the Ta-kem with the Kemtshik, the river turns north, and traversing the mountains of Seyansk by a valley which is more than 80 miles long, but very narrow and surrounded by steep and high mountains, it enters Siberia (near 93° E. long.), where it is called Yeneseï. Here it flows at first nearly due north, through the extensive vale which bears its name, and extends 350 miles from south to north. In this valley its waters are increased by those of numerous small rivers, which descend from the declivities of the mountain ranges which border the valley. None of them however are navigable, with the exception of the Abakan, which may be navigated by small river-boats as far as Abakansk. The Yenesei becomes navigable before it joins this river, at the town of Seyansk. Before the river leaves the vale it turns eastwards, washes the walls of the town of Krasnoyark and afterwards flowing northward, soon leaves the mountains and enters the plains of Northern Siberia. Here it is soon joined from the east by the Upper Toongooska, a river much larger than the Yeneseï at their junction, which brings to it the drainage of a country more than three times as large as that which previously has sent its drainage to that river.

The remotest branch of the *Upper Toongooska* is the Selenga, which rises south of the most remote branches of the Yeneseï, on the eastern declivities of the Tangnu Oöla [ALTAI MOUNTAINS, vol. i., p. 398], and runs more than 450 miles in an eastern direction within the Chinese empire, where it is joined by two considerable tributaries, the Ekhe, which rises in the lake of Kossogol, on the southern declivity of the Erghik Targak Taïga Mountains, and runs nearly parallel to the Selenga; and the Orghon, which originates in the Khangai Mountains of the Gobi, and runs from south to north. At the confluence of the last-mentioned tributary the Selenga turns to the north, and soon enters Siberia, where it is joined from the east by the rivers Chikoï, Khilok, and Uda; it falls into the Lake of Baikal after a course of about 700 miles. About 18 miles from the lake the river divides into twelve arms, which enclose a delta: the two extreme branches are 20 miles distant from one another at their mouths. Only the central one, called Serednye Ustie, is used by the vessels that ascend to the town of Selenginsk. Besides the waters of the Selenga, which drains an area of more than 140,000 square miles, the Lake of Baikal receives several considerable rivers from the east, among which the Barguzin and the Upper Angara are the largest. [BAIKAL.] According to Erman, the surface of the lake is only 1350 feet above the sea-level. Its only outlet is the Lower Angara, which leaves the lake not far from its western extremity, and on the northern side. This river runs in a narrow valley enclosed by high rocks, in a nearly northern course, through the Baikal Mountains to the town of Irkutsk. This part of its course is very rapid, as it descends 110 feet in 40 miles, measured along the windings of the river, though not 25 miles in a straight line. Below Irkutsk the current gradually decreases in rapidity; but there occur several small rapids as far as the river runs north. During this northern course it is joined from the west by the river Oka; and from the place of their junction, the name of Lower Angara is changed into that of Upper Toongooska. The lower course of this river lies from east to west between 58° and 59° N. lat.; and before it joins the Yeneseï, it receives from the south the river Choona, which flows more than 300 miles, and rises in the Erghik Targak Taïga Mountains.

The Yeneseï river, after being joined by the Upper Toongooska, runs north-west until it has crossed 60° N. lat. A little below the town of Yeneseïsk it receives from the left the Kem, a small river, which is however important as a link of the extensive line of water-communication which extends from the boundary of the Chinese empire, south of the Lake of Baikal, to the base of the Ural Mountains. The Kem generally runs parallel to the Yeneseï, but towards its mouth it turns east: it is navigable for about 30 miles from its junction with the Yeneseï. North of 60° N. lat. the Yeneseï flows due north, sometimes to the east and sometimes to the west of 90° E. long., until it approaches 69° N. lat., when it turns north-west; and before it reaches 70° N. lat. it enlarges into a wide æstuary full of low islands and shoals, which is called the Gulf of Yeneseï. This gulf is on an average 20 miles wide, and more than 200 miles long. In its lower course the river is joined by several large rivers, especially from the east, among which the most extensive are the Middle Toongooska, called also Podkamenaïa Toongooska, from a lake of that name which the Yeneseï forms a little above its confluence with that river; and the Lower Toongooska. These rivers are navigable, though they are never navigated, as they traverse a country whose inhabitants have no occasion for navigation. They were however navigated by those Russians who subjected this part of Siberia to the sway of the emperor. The river Yeneseï freezes towards its mouth about the 10th of October, and the ice does not thaw before the beginning of June.

The length of the course of the *Lena* is about 2000 miles, and the basin is estimated to contain nearly 800,000 square miles. This river rises in the Baïkal Mountains [BAIKALIAN MOUNTAINS], hardly more than 20 miles from the banks of Lake Baïkal, and about 50 miles north-east of Irkutsk. It becomes navigable 50 miles from its source, at Kotshuga, a large village, which from this circumstance has become the depôt of goods destined for the north-eastern part of Siberia and for the Russian settlements in North America. The river runs in a northern direction to Ust Kutsk, and then to the north-east, until it has passed 60° N. lat., when it turns east, and continues so to Olekminsk. From this place to Yakutsk it flows east-north-east; and from Yakutsk to 65° N. lat., north-west. The remainder of its course is nearly due north. North of 70° N. lat. it enlarges to three or four miles in width; and at its mouth forms a delta, which projects into the sea, like that of the river Maekhaun, in the peninsula beyond the Ganges. This delta is traversed by several arms of the river, three of which form navigable channels: the western is called Krestovskoi, the central one Toomatskoi, and the eastern Bukooskoi. These channels are wide, but full of shoals. The Lena freezes over in the beginning of September, and is hardly free from ice before midsummer. Among the tributaries of the Lena are some very large rivers. The Vitima, which joins it from the right, south of 60° N. lat., drains the elevated table-land east of the Lake of Baïkal, originating on the northern slope of the Yablonoï Khrebet, not far from the banks of the Ingoda, a branch of the Shilka. It first runs north-east, then north, afterwards nearly west, and again north: its course exceeds 700 miles. It is navigable to a considerable distance from its mouth. Farther east the Lena is joined by the Olekma, which falls into it nearly opposite Olekminsk. The Olekma originates likewise in the Yablonoï Khrebet, between 118° and 120° E. long., and has a northern course. It runs about 500 miles, and does not appear to be navigated: the country on its banks is covered with interminable forests, and no part of it is cultivated. The third confluent which joins the Lena from the right is the Aldan, which drains the eastern part of the elevated table-land, and receives all the waters which collect on it between 125° and 140° E. long. That branch which, from its source, is called Aldan, rises on the Yablonoï Khrebet, between 127° and 128° E. long., and runs to the north-east nearly 400 miles, receiving from the right a considerable tributary, the Maya. It then turns north, and after flowing more than 100 miles in that direction, it has a west course, until it reaches the Lena about 60 miles below Yakutsk. The lower course of the Aldan is certainly navigable, but it does not appear to be navigated. Only one large river joins the Lena from the west: this is the Vilui, which rises not far from the banks of the Lower Toongooska, near 107° E. long. and 63° N. lat., and falls into the Lena near 64° N. lat. and 128° E. long., after a course of 600 miles, running nearly always parallel to the middle course of the Lena. It does not appear to be navigated, nor is there at present any occasion for it.

Besides these large rivers, there are others of less magnitude, but still so large that they would be considered important in any other country. Two such rivers fall into the Polar Sea between the mouth of the Yeneseï and the Lena, the Anakara and Olenek. The first runs more than 500 miles, and the last above 700. East of the mouth of the Lena are those of the rivers Yana, Indighirka, and Kolyma. The Yana flows 500, and the two last-mentioned rivers each 700 miles. All these rivers are navigable, and of importance for the country, as the two greatest necessaries of life, corn and salt, are brought by them from the southern districts of Siberia to the most northern parts. The Kolyma is so favourable to easy navigation, that in 1786 two large vessels were built at Verkhnei Kolymsk, nearly 500 miles from the mouth of the river, and were brought down to the sea with the greatest ease. All these rivers abound in different kinds of fish during the summer.

The Anadyr, or Anadir, falls into the sea of Okhotsk; and so does the Amur, whose northern branches traverse that part of Siberia which lies south of the Yablonoï Khrebet. [ANADYR; AMUR.] We must still notice the small river Ud, which falls into the Sea of Okhotsk near 55° N. lat., and which attracted attention some years ago, when it was proposed to remove to its mouth the town of Okhotsk and its commerce, as the harbour of Okhotsk has changed so much as not to admit large vessels. [OKHOTSK.] It is said that the entrance of the river Ud forms a safe harbour, and that another good anchorage is found among the Shantar Islands, which are opposite to the mouth of the Ud.

Productions.—The domestic animals vary greatly in size and form in different districts. This is especially the case with horses and sheep. Among the latter, the sheep kept by the Khirghis Cossacks, in the Steppe of Ishim, are distinguished by their thick tails and fine wool: all attempts to transport this species to other parts of Siberia have failed. In 1830 some landed proprietors in the neighbourhood of Irkutsk introduced Spanish sheep, for the purpose of improving the wool of the native sheep.

Siberia is very rich in metals. There are three extensive mining-districts. The most western comprehends the mines of the Ural Mountains. On the eastern declivity of that range the mines occur between 56° and 60° N. lat., where they occupy a tract of land about 40 miles in width. These mines yield great quantities of iron, gold, and copper: there is also some silver and platinum. A silver-mine near Verkhnei Toorinsk was worked some years ago; but the works were discontinued only because the workmen could be employed more advantageously in working the gold-mines. Gold is very abundant in this tract, and is obtained either by regular mining, or by washing the alluvial soil, which contains it in very small grains. In some places platinum is united with the gold. Iron and copper mines are numerous, and the produce is abundant. It is impossible to separate the produce of the mines situated in Siberia from those which are found on the western declivity of the Ural Mountains, as the produce of both is mixed up in the accounts which are published. According to these accounts, the whole mass of iron annually procured from the Ural mines amounts to 7,400,000 poods, or 286,000 hundredweight; and that of copper to 183,000 poods, or 73,200 hundredweight. The annual produce of iron is estimated at 15,000,000 rubles, or 625,000*l.*; and that of copper at 5,490,000 rubles, or 228,750*l.* The produce of gold and platinum was valued at 15,000,000 rubles, or 625,000*l.*, twelve years ago. The whole produce of the Ural mines amounted therefore to 1,478,750*l.*, of which perhaps one-half was got from the eastern declivity of the mountains; for though the mines of iron and copper are much more numerous on the west side of the range, all the gold and a great part of the platinum were got on the east.

The second mining-district is that of Bernaul. The mines yield much silver and copper, but less gold and lead. The mines from which these metals are obtained lie mostly in the Altai Mountains and in those valleys which open to the Irtish river. Those which are within the range of the mountain system have been noticed in ALTAI MOUNTAINS, vol. i., 397. To complete this list we shall add that others, called the mines of Salairsk, are situated far to the north of the mountains, north-west of Kooznesk, and north-east of Bernaul. They are very rich in copper-ore; but the ore is poor, and would hardly pay the expense of working if the ore were not very fusible. The northern offsets of the mountains of Teletzkoi, especially the Kemchugk range and the Kooznesk Mountain, near the source of the Tom river, are rich in iron-ore, which, having been neglected, or abandoned to some families of Tartars, appear to have come into notice lately, as it is stated that their produce, which is brought to Kooznesk, had risen some years ago to 60,000 poods, or 24,000 hundredweight. We have no account of the produce of the copper and lead mines. That of the first-mentioned metal must be considerable, as copper coin is annually produced in the Mint of Susank to the amount of 250,000 rubles. The annual produce of the silver-mines from the beginning of this century has constantly been about 72,000 marcs; and there were also obtained from them, between 1799 and 1809, 1470 marcs of gold annually. The produce of the gold has increased lately, as earth has been found which contains small particles of gold, from which it is obtained by washing.

The third mining-district is that of Nertshinsk, which is situated on the east of the Yablonoï Khrebet, in the basin of the river Amur. No mines are worked on the west of the rivers Onon and Shilka, and it does not appear that metals occur in these districts, with the exception of gold, which has been recently met with in small particles. The mines which are worked occur in the low ranges between the Onon and Shilka on the east, and the Argun river on the west. All of them contain lead, and most of them also silver and zinc. The produce of lead amounts annually to 35,000 poods, or 14,200 hundredweight. This gives to the mines of Nertshinsk some importance, as no lead is found in the Ural range, and not much in the Altai Mountains. From these mines also about 390 poods of silver, 4 poods of gold, and 40,000 poods of iron are produced. In 1812 it was discovered that near the southern extremity of these mountains, where they border on the Gobi, rich deposits of tin exist; and they have begun to be worked, but nothing is known of their produce. Antimony and arsenic also exist in this country. There are some iron-mines in the valley of the river Vilui; and it is stated that this metal is found there nearly in a pure state, which is rendered probable by the circumstance that the Yakutes work the mines, and bring their produce to the town of Yakutsk. This iron is stated to be very malleable.

The western parts of Siberia get the salt which is required for their consumption from the salt lakes in the steppes of Ishim and Barabinsk, in some of which the salt crystallizes spontaneously. Two lakes of this kind occur also in the vale of the Yeneseï, on the western declivity of the Teletzkoi Mountains; one of them gives an annual produce of 130,000 poods. The countries bordering on the river Lena obtain salt partly from some salt-springs which occur in the vicinity of the town of Ust Kutsk, and partly from the river Vilui, where, according to Erman, there are some lakes in which the salt crystallizes, and he adds that from the same country rock-salt is brought to Yakutsk. Da-uria obtains its salt from one of the lakes of the Gobi, called Dabasun Lake, not far from that of Khara. Several kinds of precious stones occur in Siberia, and diamonds have been found along the eastern declivity of the Uralian range. The amethysts, topazes, emeralds, and red turmalines are of great beauty; zircons of extraordinary size have been found near Miask, south of Ekatarinburg. Several precious stones are brought from the Altai Mountains, the most valuable of which are jasper and porphyry of great beauty, of which a quarry is worked nearly in the centre of the Altai Mountains, in the valley of the river Charysh. The mountains of Da-uria contain beryls, topazes, emeralds, and some other stones of less value. In the Baikal Mountains, especially towards the western extremity of the lake, lapis-lazuli of a very fine quality is found. The most important of these minerals for domestic economy is a kind of mica, which divides into flat pieces like glass, and is extensively used all over Siberia and even in European Russia for windows. This mineral occurs in several places in Eastern Siberia, but the most extensive deposits are on the banks of the river Vitima, about 150 miles from its mouth, whence large quantities of it are annually taken. It is called Russian glass.

The tusks of the fossil elephant constitute an article of commerce, and many persons make the discovery of them the business of their life. [Elephant, vol. ix., p. 352.] These fossil bones of the elephant, mixed with those of many other animals, such as the rhinoceros, are very rare in the southern districts of Siberia, nor are they found everywhere in the northern districts. They are deposited in immense masses, which occur more frequently and are of larger extent as we proceed from south to north. The greatest number of these bones are brought from the Laikhovian Islands, but they are also numerous in the north-eastern part of Siberia east of the river Lena. They are generally found at a certain depth, mostly in hills of clay, rarely in mould, and never in sand. The harder and more consistent the clay is, the better the bones are preserved. Where the clay hills are sheltered by more elevated ground, the bones occur in much greater numbers than on the flat shores or on the level tundras. Those who are occupied in finding them follow the banks of the rivers after the inundations of the spring have subsided. The rapid course of the rivers during the inundations undermines part of the high banks, and thus the bones which are imbedded in them are brought to light. Several hundred poods of bones are annually collected.

Inhabitants.—When the Russians first entered Siberia, they found the country in possession of numerous tribes more or less addicted to a nomadic life; none of them cultivated the ground, and they had no permanent places of abode, with the exception of some Tartars in the vicinity of Tobolsk. Some of these tribes belonged to widely-spread nations, but others, often consisting of a small number of families, constituted separate nations. The small number of individuals in the several tribes rendered them unable to make effectual resistance to the Russians, who gradually subjugated this immense country. In this struggle some of the smaller tribes seem to have entirely disappeared, or perhaps a remnant of them united itself to some neighbouring tribe, and was gradually incorporated. The Yakutes on the Kolyma river preserve a tradition that the country on both sides of that river was once inhabited by a nation called Omoki, which left that country and emigrated westward; but there seem to have been no traces of this tribe when the Russians took possession of Siberia. Though it is certain that several tribes or nations have disappeared, there are still about thirty tribes, differing more or less in physical character and in language. Some of them belong to the Caucasian race, and others are akin to the Mongols. In noticing these tribes, we begin from the Ural Mountains and proceed eastward.

The most north-western part of Siberia is occupied by the Samoyedes. [Samoyedes.] South of the Samoyedes are the Ostiaks, who occupy both banks of the river Obi from Obdursk upwards to the confluence of that river with the Irtish, and even south of this place there are some families. They do not seem to extend on the west to the Ural Mountains, as that part of Siberia is in possession of the Vogules; but they occupy the northern districts of the steppe of Barabinza, as far south as 60° N. lat. Eastward they are spread over the whole of the wooded region to the banks of the Yeneseï. They are described as being of rather low stature and feeble; the lower limbs are very thin. The face is pale, and flat, and without any characteristic feature. The hair generally approaches to red, or at least is light. Their language shows their kindred with the Finns, and in one-third of the words which he collected, Erman found that the roots occurred in the language of the Hungarians. As however this nation is spread over an immense tract of country, there is some difference between the language of those who live north of Berezow and those who occupy the banks of the Obi before its confluence with the Irtish. The first dialect is called *Nisovi*, and the second *Verkhovi*. In the latter a great number of words occur which are derived from the languages of the Vogules and Tartars, who live to the west and south of them. The Ostiaks derive their subsistence chiefly from their fishing in the rivers, and are exclusively occupied in this way during the summer. In winter they hunt the wild animals, especially reindeer and elks, and also bears, foxes, and squirrels. Dogs are the only domestic animals that they keep, and they use them in winter for drawing their sledges. For more than a century a portion of them have been converted to Christianity, but it is stated that they still adhere to most of their heathen practices. The majority are still addicted to that religious worship which is known by the name of Shamanism. The priests are very expert jugglers, and their dignity is hereditary. The number of Ostiaks, some thirty years ago, was estimated at 100,000 individuals; but Erman was informed that their number was decreasing, which is probably to be attributed to the circumstance that the Russians, who have settled in their country, have found the means of occupying the best fishing-places. The fur dresses made by them of reindeer skins, and their boots, which are made of the skin taken from the legs of these animals and cut into thongs, are much valued, and are an article of export. The boots are much used in European Russia.

The Vogules live to the west of the Ostiaks, occupying the woods, and the mountains, valleys, and plains included within the Ural range and its declivities; they are even in possession of a narrow level tract along their base. In the plain they are found as far southward as the Toora. They are noticed under Russia [vol. xx., p. 247].

In the agricultural district which extends south of the country occupied by the Vogules and Ostiaks, the population consists of Russians and Tartars, and in most parts the latter are more numerous. The Tartars settled in these countries before the Russians took possession of them, and they are distinguished by several names. Those who live on the west of the Tobol are called Tooralinzes. They resemble in their habits the Tartars of Kasan [Russia, vol. xx., p. 247], but in their features they approach nearer to the Mongol race. Though the basis of their language is Turkish, many words of Russian or Vogulian origin are mixed with it. They are chiefly occupied in agriculture and the rearing of cattle; in winter they hunt the wild animals of the forests. They have been converted to Christianity, but it is said that by this conversion they have partly lost that degree of civilization which the Tartars of Kasan, who have adhered to the Islam, have preserved to the present day. The Tartars who live east of the river Tobol as far as the banks of the Irtish, are known by the name of Tartars of Tobolsk. They are distinguished from their western neighbours by having adhered to the Islam, and by their fondness for travelling: hardly a caravan goes to Bokhara of which they are not the leaders. The Barabinzes, another tribe of Tartars, inhabit the steppe which bears their name. They seem to have made less progress in agriculture, and to have retired to the wooded northern regions of the steppe, where they cultivate small spots, and chiefly live on the produce of the chase. The most eastern of their tribes inhabit the mountains of Kooznesk, and are called Koosnezi, that is, smiths, on account of their occupation. They unite agriculture with mining, and produce annually a large quantity of iron, though in a very clumsy way. The number of Tartars in all these parts probably exceeds 120,000. A considerable number of Bokharians have settled among the Russians and Tartars. It appears that some of them emigrated before the Russians had taken possession of the country, and most of these families have adopted the manners of the Tartars, and at present can hardly be distinguished from them. They have however preserved their own language, and many of them are employed as interpreters in the commercial intercourse between the Russians and the merchants of Bokhara who visit Siberia. Others are merchants themselves.

The Bashkires are noticed under Russia [vol. xx., 248]. We shall here only observe that this tribe is not found north of Ekatarinburg, but that between this place and Slatoust they constitute the bulk of the population. Between Slatoust and Troisk many families of Chuvashes, Teptiares, and Metsheriakes [vol. xx., 247 and 248] are settled among them. It is however observed that the Bashkires do not live near the base of the Ural Mountains, but always at some distance from them. Though this nation is numerous on both sides of the range, the range itself is occupied by Russian and Tartarian families.

The Khirghis Cossacks, commonly called Kirghises, are one of the widest-spread nations in Asia, nearly the whole of the Caspian Desert being in their possession. Though a considerable portion of this nation is in some degree dependent on Russia, and another portion on China, their dependence is rather nominal than real, and their country is considered a part of TURKISTAN. We add here a few observations on their relation to the Russian government. That part of their country which is contiguous to the Ishim line of fortifications is inhabited by the Middle Orda. Internal discord, civil wars, and the growing power of the Soongares [SOONGARIA] had thrown the different tribes of this orda into such disorder, that in 1732 some of their princes submitted to the sway of Russia, but they continued their predatory incursions into the south-western parts of Siberia, and did not pay any tribute. After the downfall of the power of the Soongares (1756), they took the oath of allegiance to the Chinese emperor; and one of their sovereigns, Ablai, relying on the assistance of both emperors, tried to increase his influence on the orda, and to have the whole power in his hands, and it seems that he nearly succeeded in obtaining his end. About that time the Kirghis ceased to be troublesome to the inhabitants of Siberia; and when the death of Ablai (1795) was followed by new dissensions among the chiefs of the orda, Russia was enabled to increase its influence over them. It was then agreed that the khan or sovereign of the nation should not be considered as such till he was recognised by the Russian government. In 1823, at the request of the Khirghis, Russia established an agricultural settlement at Kar-Karaly, not far from the norther declivity of the Ulutan Mountains (near 50° N. lat. and 75° E. long.), and it then succeeded in forming a kind of central government among them. The families and tribes which have submitted to Russia are divided into *aules* and *volostes*, and form together an *okrughi*. Each aule is governed by the elders of the families that compose it, and each voloste is managed by a chief called sultan. But the supreme authority of the okrughi is vested in a divan or *prikas*, at the head of which an old sultan is placed, and which consists of two deputies sent from Petersburg, and of two others chosen by the Khirghis themselves. The president of the prikas is also chosen by the Khirghis for three years, and is paid by the Russian government. To ensure obedience to the decisions of the prikas, the Russians have placed 200 Cossacks and 40 infantry, with a few pieces of artillery, at Kar-Karaly; and some Cossacks are stationed on the road which leads from this settlement to Semiyarsk on the Irtish, to maintain the communication between these two places. The Middle Orda is stated to be composed of 210,000 kibitkas, or families, but probably less than one-half of them have submitted to Russia.

The interior of the Altai Mountains is inhabited by a tribe of Calmucks, who are called the Calmuck mountaineers. They are found in the upper valley of the Charysh river, in the valleys of the different upper branches of the Katunga, and as far east as the banks of the Choolyshman. Those who inhabit the eastern districts, namely, the valleys of the Chooya, Bashkaus, and Choolyshman, pay tribute both to the emperor of China and of Russia. Pallas was of opinion that they were a mixture of Khirghis Cossacks and Calmucks, but modern travellers find in them the true physiognomy of the Calmucks. They lead a wandering life, and live chiefly on the produce of their horses, cattle, and sheep; in some places they have also camels. In winter they hunt the wild animals of their forests. On the banks of the river Choolyshman they cultivate barley, tobacco, and a little wheat. In summer they live with their herds on the higher declivities of the mountains, and in winter they descend to the wide and flat valleys which are so common in that part of the Altai Mountains. They are acquainted with the working of iron, and they make their own guns, and the pipes that they use, which are also of iron. They also make iron balls for their guns, and their own powder. According to their statement, saltpetre and sulphur are found in their country. They do not, like the other tribes of the Calmucks, adhere to Buddhism, but they are still heathens. A few of them who have settled in the vicinity of Biysh on the Obi have embraced Christianity, and they cultivate the ground. The number of Calmuck families in the Altai Mountains, in 1816, was stated at 1500, but their pasture-grounds begin to decrease on account of the agricultural settlements of the Russians, which increase rapidly, and advance farther into the valleys.

The nations hitherto noticed occupy extensive tracts of country; but between the lakes of Teletskoi and the neighbourhood of Irkutsk there is a number of small tribes: the most eastern of them are the Telesses or Telengutes, who occupy the western declivities and valleys of the mountains of Teletskoi, which terminate on the eastern banks of the lake of Teletskoi, and the mountains which extend from the northern extremity of the lake along the eastern banks of the Biya as far north as the range which is known by the name of Kuznesk or Salaïrsk Mountains, in which the Tom river originates. It was formerly thought that this tribe, which was well known two centuries ago, had become extinct, but a modern traveller has found that they still occupy these places to the exclusion of all other nations; but their number is very small. If we may judge from their physical character and their language, they belong to the Turkish nations. They live in the mountain valleys, chiefly on the produce of their herds of cattle and horses, and partly by hunting the wild animals. Their religion is Shamanism.

On the eastern declivities of the mountains of Teletskoi there are four nations of Turkish origin; the Biryusses, the Beltires, the Sagaï, and the Katshinzes. These tribes are in possession of the mountains and adjacent country as far east as the banks of the river Abakan, an affluent of the Yeneseï. The most southern tribe, which approaches the source of the Akaban, but extends nearly to 53° N. lat., are the Biryusses. Formerly they lived entirely in the mountains, but now they descend to the valleys, where they have fine meadows along the river, and cultivate rye and barley. Though they have cattle and sheep, they still are much given to hunting, and their country abounds in elks, deer, wild hogs, sables, lynxes, beavers, otters, gluttons, and squirrels. A few of them have become Christians, but the larger number are stated to adhere to Shamanism. North of them live the Beltires and Sagaï, two small tribes which seem to live together. Their physiognomy proves their true Turkish origin; though their language contains Mongol roots, and their pronunciation differs considerably from that of the Tartars. They live principally on the produce of their herds of cattle and horses, both of which domestic animals are distinguished by their size. They pass the summer on the mountains, but in winter they occupy with their herds the western banks of the Abakan. The Beltires have made some progress in cultivating grain, especially summer-rye and barley. The Sagaï do not cultivate the ground, but use as food several roots which grow spontaneously in the mountain-tract. They have been baptized, but the shamans appear to have preserved their authority among them.

The most northern of these Turkish tribes are the Katshinzes, who occupy the country along the banks of the two rivers called Yoos, and extend eastward to the banks of the Yeneseï. The greater part of their country is a fine prairie covered with a thick turf, and enjoying a mild climate. On these natural meadows the cattle find pasture all the year round, as the quantity of snow which falls is far from being great. Their language also contains many Mongol words, and approaches that of the Yakutes. As their country does not abound in animals, they derive their subsistence from the large herds of cattle and horses. The cattle are large, but the horses are small. They also keep many of the large-tailed sheep. Cultivation, which was introduced among them about one hundred years ago, seems to have made some progress. They sow Siberian buckwheat and barley. Only a small number of them, who have settled as agriculturists on the banks of the Choolym, have embraced Christianity; the others adhere to Shamanism.

Between the rivers Abakan and Yeneseï are the Koibales, and many families belonging to this tribe are found east of the last-mentioned river, under the name of Motores and Kandym. Their face resembles that of the Toongoses, being flat and round. Pallas considers them to be the principal stock of the Samoyedes, and thinks that those tribes of Samoyedes which are at present found along the Polar Sea [SAMOYEDES] were at a remote period separated from them. All of them have embraced Christianity, but they have preserved the shamans. They are an industrious race, having adopted agriculture and the use of the plough; but they still consider their cattle, horses, and sheep as their principal wealth. They also keep some camels. The Koibales are excellent hunters, and their country abounds in elks, deer of several kinds, sables, beavers, otters, lynxes, and squirrels. This tribe alone manufacture the wild hemp and flax which grows in these parts of Siberia. They make ropes of it.

In the mountains which divide the valley of the Yeneseï from the plain of the Lower Angara there are several tribes allied to the Koibales in origin and language. The most northern, on the banks of the river Kam, are called Kamashes, and south-east of them, on the Uda, are the Karakas and Kangut. These two tribes do not cultivate the ground to any great extent, nor have they large herds, except of reindeer; but their country abounds in wild animals, and the skins of their sables are much valued. They still adhere to Shamanism. Four small tribes inhabit the northern declivity of the Erghik Targak Taïga Mountains. They are called by the Russians Silpigursk, Udinsk, Karagansk, and Kamgatsk. The last-mentioned tribe is said to be of Turkish origin, but the others are Samoyedes. They have herds of reindeer, but principally live by the chase.

In the undulating country which lies between the lower course of the river Choona, an affluent of the Upper Toongooska, and the Yeneseï, are the Yarinzes, whose language shows that they also belong to the Samoyedes. They are chiefly agriculturists, and pay great attention to the rearing of cattle. Their number is small.

Nearly contiguous to this country, but on the western side of the river Yeneseï, and north of the town of Yeniseïsk, are the Kasuimskie Ostiaks, also called the Ostiaks of the Yenesei. This tribe differs greatly in physical character as well as in language from the Ostiaks on the river Obi, and in both respects approaches closely to the Samoyedes, and especially to the Yarinzes. Their country is unfit for agriculture, and they are chiefly occupied in fishing, but they keep many reindeer, and hunt the wild animals with which their country abounds. This is the most northern of the southern tribes which are of Samoyede origin, but even their most northern settlements are still more than 700 miles distant from the countries that are inhabited by the northern Samoyedes.

The most populous of all the nations that inhabit Siberia, next to the Russian, are the Buriates, who occupy the country on both sides of the Lake of Baikal, and extend towards the east as far as the western banks of the river Onon. An account of this great division of the Mongolic nation is given under BURIATES. It is now quite certain that their priests have a very rich literature, mostly on the subjects of Buddhism, which a great part of the Buriates have embraced, but the classical sacred books are written in Sanscrit. South of the Buriates, along the very boundary-line of the Chinese empire, between the rivers Selenga and Onon, a small number of Khalkas Mongols are settled.

The most widely dispersed of the native nations of Siberia are the Toongooses. They occur even in Da-uria, particularly between the Onon and Argun, and the northern districts of Mandshooria are also peopled with them. In these parts they unite agriculture with the keeping of animals, especially the reindeer. Farther north they are in possession of the country that encloses the Lake of Baikal on the north, and hence they extend to the Polar Sea. On the shores of this sea they are found from the Choun Bay on the east (170° E. long.) to the Gulf of Katunga (110° E. long.). Along the banks of the river Yeneseï they are found from some distance below Toorookhansk upward to the mouth of the Upper Toongooska, and along the shores of the Sea of Okhotsk from the boundary-line of the Chinese empire to the town of Okhotsk. Some parts of this extensive country are exclusively occupied by them; in other parts they are found by the side of the Yakutes, Yookahires, and Choowanzes. Those who live along the Sea of Okhotsk are called Lamootes, a word which signifies 'inhabitants of the shore.' Another numerous tribe which occupies the country east of the Yeneseï in the vicinity of Yeneseïsk is named Chapogires. The Toongooses are considered as the best formed of the native tribes of Siberia. They are generally of middling size, of a fine shape, and slender. Their face is less flat than that of the Mongols, their eyes small and lively, and their nose well formed, though rather small. Many of them have no beard, and the rest have very little. Their hair is black and lank, and rarely grows grey in old age. They are most accomplished horsemen. Though widely spread over an immense country, the language of the most distant tribes of the Toongooses is said to differ very little, and to agree with that of the Mandshoo. Many roots are found in the Mongolic and Turkish languages, and even in some of the languages of Europe, especially the Slavonian and Finnish. With the exception of those who live in Da-uria, the Toongooses do not cultivate the ground, but live partly by their herds of reindeer and sheep In the southern districts they have also horses, but not cattle They are very skilful hunters. When they have lost their reindeer and sheep by any misfortune, they settle on the banks of the rivers and gain their livelihood by fishing, but do not generally change their abode, which is the case with all the others. The Toongooses have acquired some skill in working iron and in tanning. Their religion is Shamanism

The Yakutes, the most populous of the nations of Eastern Siberia except the Buriates, live in the country which is inhabited by the Toongooses. But the Yakutes are almost entirely occupied with the care of their herds of cattle and horses. They do not keep reindeer, and they neglect both the chase and fishing, except a few families, who by some chance are settled in such parts as have no pasture-ground. As the rearing of cattle and horses, and the dairy, almost entirely engross their attention, the bulk of this tribe is found in the vicinity of the town of Yakutsk, which has derived its name from them, where an extensive country with a fertile soil is found between the Lower Aldan and the Lena, and along the banks of the river Vilui. Many families in these parts possess several hundreds and even thousands of cattle; but in other parts also they have taken possession of all the tracts which can be converted into pasture-grounds as far north as 66°. Some families are met with even on the shores of the Polar Sea, but they obtain their subsistence by fishing and hunting. The Yakutes are Turks, as is proved by comparing their language with that of the Tartars of Tobolsk. Erman, who has investigated this point, found that of 297 words of the Yakute language, only 114 did not occur in the dictionary of the Turkish language of the Tartars, and he thinks that it can hardly be doubted that a Yakut born on the Aldan could make himself understood by an Osmanli of Constantinople. The number of roots which the Yakute language has in common with the Mongol languages seems to be small. As many of the Yakutes are wealthy, they begin to pay some attention to the education of their children. They appear also to have attained a considerable degree of skill in tanning, and in working iron, which they get from the mines on the upper course of the river Vilui. Towards the end of the last century, as appears from Sauer, the Yakutes still adhered to Shamanism; but if we may judge from what is said by Erman, those at least in the vicinity of Yakutsk have been converted to Christianity.

The Yookahires are only found north of the polar circle, and mostly in parts where the wooded regions border on the tundras. They only live east of the Lena, and as far as the vicinity of Choun Bay. The unsuccessful wars with the Tshooktshes have much reduced their numbers. They have lost most of their herds of reindeer, and have been obliged to turn hunters, and gain chiefly their subsistence by the chase of the wild reindeer and the wild geese, which are more numerous here than in any other part of the world. The Yookahires have black eyes, dark hair, and rather long but regular features. They are extremely fair; and a modern writer says that they resemble the Russians, whose language is generally spoken among them. They live in tolerably large houses, built of timber, and do not wander about, as the animals which supply them with food pass through the places inhabited by them twice a year. In winter they hunt sables, ermines, gluttons, and foxes, the sable is still numerous in these parts, and its skin is much valued. In some places where their settlements are distant from those of the Russians, they still speak their own language. By these the Shamans are still considered as priests, but in the vicinity of the Russian settlements only as jugglers. The tribe of the Choowanzes have been almost destroyed in their wars with the Tshooktshes, and the few families still remaining have united with the Yookahires.

The Tshooktshes occupy the most north-eastern peninsula of Asia. To the west this tribe is met with as far as Choun Bay, and southward they are in possession of the whole basin of the Anadyr river. They do not pay any tribute to the Russians, except a small contribution to maintain the fair at Ostrownoye, which is numerously attended by them. The Russians do not consider them as subjects of their emperor, and the Tshooktshes are very jealous of their independence. On this account they do not easily permit Europeans to enter their country.

This country appears to be inhabited by two tribes, different in language and in physical character, as well as in their mode of living. One of these tribes, which is called the *sedentary* Tshooktshes, on account of their having fixed habitations, speak a dialect of the language of the Esquimaux, whom they also resemble in person. They occupy the coast, and live on the produce of their fishing. The others are the nomadic Tshooktshes, who constitute one nation with their neighbours the Koriakes. They differ from the sedentary Tshooktshes in their stature and features. Cook probably saw them, when he says in his last voyage, that the natives of America which he had seen before were rather low in stature, with round chubby faces and high cheek-bones, whilst the Tshooktshes have long visages, and are stout and well made. This tribe lives for the greater part of the year in the interior, where they find pasture for their large herds of reindeer on the mountains and in the swampy places, but are frequently obliged to change their place of abode.

These two tribes live in peace, and a considerable intercourse exists between them. The sedentary Tshooktshes exchange the produce of their fishery, namely, the flesh and ribs of the whales, the thongs of the skin of the morse, and train-oil, for the skins of reindeer and dresses made of this material.

As their country is generally destitute of trees, they pour train-oil on the bones of the whale, and use them as fuel. No drift-wood is found on the coast inhabited by the Tshooktshes. The whales only are found in abundance along the coast of the Polar Sea as far west as the island of Koliutshin: they are much more rare between that island and Cape Shelagskoi, and they do not occur west of this cape. This is partly also the case with the morse and seal, and for that reason the eastern part of the coast which is inhabited by the Tshooktshes is much more populous than the western. The sedentary Tshooktshes also kill common bears, white bears, and polar foxes, but in general they are not much given to hunting, though their country abounds in wild animals, especially reindeer and argali; but they are merchants. The nomadic Tshooktshes live on the produce of their reindeer alone. There exists among the Tshooktshes an hereditary slavery. The slaves are found in the rich families, and are not permitted to leave them; they cannot acquire property, and are employed in the meanest and most difficult labour. The Tshooktshes themselves are not able to give any account of the origin of this slavery. These tribes still adhere to Shamanism. In the country of the Tshooktshes, on the Bay of Anadyr, there is still a small remnant of a tribe, called Onkilon, which is little known, but is stated to resemble the Esquimaux in stature and language.

The Koriakes inhabit the northern part of the peninsula of Kamtchatka and the country about the gulfs of Penshinsk and Ishiginsk, as well as the mountains of Stanovoï Khrebet. They differ greatly from the Tshooktshes, being short, and having a small head, a short nose, and a very large mouth. Their hair is black, and their beard very thin, but the eye-brows very long. They are said to speak three different dialects, one of which is also used by the Tshooktshes. Like the Tshooktshes, they are divided into two classes, maritime and nomadic Koriakes, but it is said that both of them are inferior to their neighbours in strength of body as well as in their mental faculties. They also adhere to Shamanism. The peninsula of Kamtchatka is inhabited by Kamtchatdales. [Kamtchatka.]

Population.—The population of Siberia is now estimated at more than two millions and a half, exclusive of the Middle Orda of the Khirghis Cossacks, which is computed at more than a million of individuals, in 210,000 families or kibitkas. [Russia, vol. xx., p. 257.] But this population is very unequally distributed over the surface of the country. Even the most populous districts, namely, the agricultural region in Western Siberia, the vale of the river Yeneseï in Central Siberia, and the plain of the Lower Angara, would be considered very thinly peopled in any part of Europe, but they are thickly inhabited when compared with other parts of Siberia, where several tracts occur extending over a surface of from 20,000 to 30,000 square miles, which are entirely uninhabited, as for instance the country south and north of the Verkhnei Yansk Mountains. In other places a few families live at the distance of one or two days' journey from one another.

The majority of the present inhabitants are Russians: all the other tribes do not yet amount to one million. According to an estimate made about 50 years ago, the population of these tribes was as follows:—

Samoyedes	24,000
Ostiaks of the Obi . . .	66,000
Vogules	11,000
Bashkires and Choowashes .	3,000
Tooralinzes	80,000
Tartars of the Tobolsk . .	18,000
Barabinzes and Kooznezi .	10,000
Kalmucks	50,000
Telesses	1,200
Biryusses, Beltires, and Sagai .	1,000
Katshinzes	2,000
Koibales, Kumashes, Yarinzes, &c.	6,000
Kasuimskie Ostiaks . . .	40,000
Buriates	250,000
Khalkas Mongols	15,000
Toongooses	60,000
Yakutes	120,000
Yookahires	1,200
Koriakes	1,700
Tshooktshes	3,000
Kamtchatdales	2,700
	763,800

More recently, when a census of these tribes was taken for the purpose of regulating the tribute or *yesac*, it was stated that the population of most of them had increased, and in some tribes considerably. This census has not yet been published, but it is to be presumed that it is included in the estimate which carries the population of Siberia to 2,645,100 [Russia], and that all the tribes, exclusive of the Russians, exceed one million individuals. If we suppose the estimate not to be exaggerated, which probably is the case, there is only one inhabitant in Siberia on each square mile and a quarter.

Political Divisions and Towns.—The administration of Siberia was formerly vested in one governor-general, who resided at Tobolsk, and whose authority was more extensive than that of the governors of the Russian governments in Europe. In 1822 it was found expedient to divide Siberia into two general governments, those of Western and Eastern Siberia. Western Siberia consists of the governments of Tobolsk and Tomsk and the province of Omsk; and Eastern Siberia of the governments of Yeneseïsk and Irkutsk, and the provinces of Yakutsk, Okhotsk, and Kamtchatka, to which are added the Russian settlements on the western coast of North America as far south as California. All these divisions are governed by separate officers, who receive their orders from the governor-general, and can only apply to the court of Petersburg through him. A small but very important portion of Siberia is not subject to the authority of the general governor, but is united to the European governments of Perm and Orenburg.

That part of the government of Perm which is on the east of the Ural Mountains extends along their base from 55° 30′ to 61° N. lat., and is the most populous, best cultivated, and most industrious portion of Siberia. In its northern districts are the Vogules, and in the southern the Bashkires, but the greater part is inhabited by Tooralinzes and Russians. Nearly all the numerous mines of the mining-district of the Ural are included in this division. Besides Ekatarinburg or Yekatarinburg [Ekatarinburg], which is the seat of administration for the mines, it contains several remarkable places, as Berezow, with [illegible] inhabitants, in whose vicinity gold is obtained by mining and also by washing; Newansk, with 10,000 inhabitants and extensive iron-works, where gold is also got by washing; Alpayewsk, with 2000 inhabitants, and iron-works; Nishne-Taghilsk, with more than 20,000 inhabitants, in a district noted for its rich iron and copper mines and its washings of gold and platinum. In this place there are also extensive manufactures of lacquered-ware. Kushwinsk, farther north, with about 6000 inhabitants, is built in the centre of a district rich in iron-mines; in its vicinity is the iron-mountain called Bladogat, which rises to 1370 feet above the sea level. Verkhoturye has 3000 inhabitants, and is considered the most northern point where the alluvial beds that contain gold particles occur. They have been traced southward to the source of the Ural river, a distance exceeding 600 miles. All these places are near the base of the Ural Mountains. At a considerable distance from the mountains is Irbit, where a fair is annually held, which was formerly much frequented, but since the establishment of the great fair of Nishnei Novgorod it has lost much of its former importance. But even at present the value of the goods brought to this place amounts to 35,000,000 rubles, or nearly 1,500,000*l.* Dalmatow, on the river Isset, has 1500 inhabitants, and also an annual fair.

Only a small portion of the government of Orenburg lies east of the Ural Mountains. It is partly inhabited by Russians and Choowashes, and partly by Bashkires. Its wealth consists chiefly in cattle. The largest town is Chelyabinsk, on the small river Mias, not far from the base of the Ural Mountains, with 5000 inhabitants. North-east of Chelyabinsk is Miask, the most southern place where gold is obtained by washing. Troitzk, on the river Oüi, with 3000 inhabitants, is a place of some trade, but its commerce is now limited to trade with the Khirghis Cossacks who inhabit the country south of the Oüi.

I. *Western Siberia* comprehends the whole of the basin of the river Obi and its affluents, with the exception of those portions which are united to the governments of Perm and Orenburg, and the basin of the upper course of the rivers Choolym and Ket, which belongs to Central Siberia.

1. The government of Tobolsk comprehends the whole of Western Siberia north of 60° N. lat. and the western half of it south of that parallel, exclusive of the country of the Khirghis Cossacks. It is divided from the last-mentioned region by a line running parallel to and only at a short distance north of the Ishim line of fortifications, and from the government of Tomsk by a line running nearly south and north across the Steppe of the Barabinzes. The continuation of this line through the country north of the river Obi to the source of the river Taz, which falls into the Gulf of Obi, separates Tobolsk from the government of Yeneseïsk, which belongs to Eastern Siberia. The nations which inhabit it are Samoyedes, Ostiaks of the Obi, Vogules, the Turkish tribes of the Tartars of Tobolsk, and of the Barabinzes and Bokharians. The number of Russians however is greater than that of all these nations taken together. No metals are found except some bog-iron; but salt is got from several lakes. The wealth of the southern districts consists in the produce of agriculture and the herds of cattle; those of the northern, of that of the fisheries in the river Obi, and of the numerous wild animals that inhabit the extensive forests. In the southern districts wood is scarce, except along the base of the Ural Mountains.

The capital is Tobolsk, where the governor-general of Western Siberia resides. [TOBOLSK.] In the comparatively populous district which extends south-west to the boundary of Perm are Toorinsk, on the river Toora, with 7000 inhabitants, mostly Tooralinzes, who carry on a considerable trade in furs, and have many tanning-pits; and Tioomen, with 10,000 inhabitants. Tioomen is the oldest city in Siberia, having been founded by Tartars in the time of Genghis Khan, whence it still is called by them Genghistora, that is, city of Genghis. There are some tanneries and soap-houses, and some worsted stuffs are made. The commerce is mostly in grain, and partly also in furs and a great number of articles made of wood. On the banks of the river Tobol are the towns of Yalootorovsk, with 2000 inhabitants, and Koorgan, with about 1000 inhabitants. In the vicinity of the last-mentioned place there are numerous antient tombs in the form of small hills; they are called *koorgani*. One of them, called by Pallas a royal mausoleum, is nearly 500 feet in circumference. East of Tobolsk is Tara, built on the west bank of the Irtish, with 3600 inhabitants, who carry on a considerable trade in the agricultural produce of the adjoining country and of the fishery in the river and the lakes. Vessels of 300 tons burden go from here to Tobolsk. Surgut, north-east of Tobolsk, on the river Obi, is a small place with 1500 inhabitants: it has some trade with the Ostiaks who inhabit the country north of the town. Berezow, on the west bank of the Obi (63° 56′ N. lat.), has 3000 inhabitants, and a considerable traffic in furs and fish. It is the most northern place in which rye and barley succeed. Still farther north is Obdursk, near the polar circle, a small and miserable place, which however is of some importance as it is the principal market to which the Samoyedes who inhabit the country between Arkhangelsk (Archangel) and the river Yeneseï bring the produce of the chace.

2. The province of Omsk consists properly of two lines of fortifications and of the country of the Khirghis Cossacks. The western line lies across the steppe of Ishim, and is called the line of Ishim. The other line is called the line of the Irtish, and extends along the banks of the Irtish from the town of Omsk to the boundary of the Chinese empire. Both lines were erected for the purpose of keeping in awe the Khirghis Cossacks. Along the line of the Irtish there is cultivation in many places, but otherwise the whole country is a steppe, and only fit for pasture. The capital, Omsk, is built on the east bank of the Irtish, at the point where the two lines of fortifications meet. It is a well-fortified place, with 7500 inhabitants, and contains a military school for the Cossacks and a college for those who wish to learn the languages of Western Asia. From this place, as well as from two of the fortresses, from Petropawlawsk on the Ishim, and from Semipalatinsk on the Irtish, caravans depart for Tashkend in Kokan, and for Bokhara, traversing the steppe of the Khirghis Cossacks. Ust Kamenogorsk, on the Irtish, has about 2000 inhabitants. The new agricultural colony of Kar-Karaly, with the steppe of the Khirghis Cossacks, belongs to this province.

3. The government of Tomsk extends over the greater part of the steppe of Barabinza, over the Altai Mountains west of the Choolyshman and the Lake of Teletzkoi, and over the hilly country which is on the east of the Obi river, and reaches as far north as the course of the Ket river. In the western districts there are the Barabinzes, in the eastern the Tartars called Kooznezi, and within the Altai Mountains the Mountain Kalmucks. The mountains are rich in metals (silver, copper, lead, iron), and in grass; the steppe abounds in wild animals, and the eastern districts in agricultural products, but even here cultivation does not extend much beyond the bottoms of the rivers. The capital is Tomsk, a town containing from 8000 to 9000 inhabitants, on the banks of the river Tom, and on the great road leading from Western to Eastern Siberia. Owing to the last-mentioned circumstance, it has an active trade with Tobolsk and Irkutsk. It is rather a well-built town. Kooznesk, on the river Tom, with 3500 inhabitants, lies in a district which abounds in iron and copper mines, the produce of which is brought to this place. Bernaul, on the west and elevated banks of the river Obi, is the centre of the mining industry in the Altai Mountains, as the ore of most of the mines is brought to Bernaul to be smelted, owing to the want of fuel in their neighbourhood. It contains between 8000 and 9000 inhabitants, extensive furnaces, and a school of mineralogy. Many Germans are employed in the town and vicinity, and a German church and school have been erected: there is also a public library. The principal mining-districts are noticed in ALTAI MOUNTAINS [vol. i., p. 397]. At Kolywan, which stands in a valley of the Altai Mountains on the small river Loktefka, there is a manufactory in which many objects are made of porphyry. Biysk, a fortress on the river Biya, not far from its confluence with the Katunga, has 2000 inhabitants.

II. *Eastern Siberia* comprehends a very small portion of the basin of the Obi river, that of the upper course of the rivers Choolym and Ket; but it comprises the whole of those of the Yeneseï, Lena, Yana, Indighirka, Kolyma, and Anadyr; and also Da-uria, or that part of the basin of the Amur river which belongs to Siberia. It contains the following governments and provinces:—

1. The government of Yeneseïsk extends from the mountains of Sayansk, or from the boundary of the Chinese empire to the Polar Sea and to the North-east Cape, being about 1800 miles in length. It comprehends the whole basin of the Yeneseï, with the exception of the upper basins of its confluents the Upper and the Lower Toongooska; the upper basins of the Choolym and Ket rivers, which fall into the Obi, belong also to this division. It is partly divided from Tobolsk by the river Taz; and from Yakutsk, which lies east of it, by the Anakara. The tribes which inhabit it are the following, enumerated from north to south: the Samoyedes, Yakutes, on the Anakara and Lower Toongooska; Toongooses, east of the Yeneseï, especially that tribe of them which is called Chapoghires; Kusnimskie Ostiaks, west of the Yeneseï; the Yarinzes, Kamashes, Karakas and Kangut, Silpigursk, Udinsk, Karagansk and Kamgatsk, east of the Yeneseï, above its confluence with the Upper Toongooska; and west of it are the Katshinzes, Beltires, Sagaï, Biryusses, and

Koibalos. Agriculture does not extend north of the town of Yeneseï (58° N. lat); but it is in a prosperous condition in the vale of the Yeneseï, south of Krasnoyark, though even there cattle constitute the principal wealth of the inhabitants. Iron-ore abounds in the mountains that enclose the vale, and it is worked in a few places. North of the town of Yeneseïsk the inhabitants live chiefly by fishing. The capital of this government is Krasnoyark, on the Yeneseï, with 3300 inhabitants. Being situated on the great road that leads from Tomsk to Irkutsk, it carries on an active commerce. There is a literary society in this town, which publishes a periodical work. Yeneseïsk, farther north, was formerly the capital, and is still the most populous place, having between 4000 and 5000 inhabitants. As this place is on the great water-communication between Eastern and Western Siberia, the commerce is much greater than that of Krasnoyark. The fair in the month of August is much frequented. Atshinsk, west of Krasnoyark and the Kachooga Mountains, contains between 1500 and 2000 inhabitants, and has some commerce, as the river Choolym is here navigable for large river barges, by which the produce of the vale of the Yenesei is carried to the countries farther west. Toorookhansk (near 66° N. lat.), on the Yeneseï, is small; but at certain seasons of the year it is visited by the neighbouring nomadic tribes, who exchange their furs for tobacco, flour, and other necessaries.

2. The government of Irkutsk comprehends the basin of the greater part of the Lower Angara and the Upper Toongooska, and also that of the Potkamenaïa Toongooska; it also comprehends the upper basin of the Lena to 60° N. lat., that part of the elevated table-land of the Baikal which lies west of the river Vitima, and all the countries whose drainage runs to the Lake of Baikal; to which is to be added Da-uria, or the country east of the Yablonoï Khrebet. No part of this government, except the table-land of the Baikal and the more elevated parts of its numerous mountains, is too cold for cultivation; and in many parts agriculture is successfully cultivated: cattle, horses, camels, and sheep constitute the principal sources of wealth. The Buriates occupy the countries on both sides of Lake Baikal, and as far east as the Yablonoï Khrebet. Near the boundary of Mongolia are the Khalkas Mongols; the Toongooses are found in Da-uria, on the table-land of the Baikal, and in the valley of the Lena.

The capital is Irkutsk, the residence of the governor-general of Eastern Siberia. This town is built on the east bank of the Lower Angara, opposite the mouth of the river Irkut, from which its name is derived. It is about 25 miles from the banks of Lake Baikal in a straight line. A small river, the Ushakowka, falls into the Angara, within the town. The streets run parallel to the Angara, are straight and wide, but not paved. In 1829 it contained 1900 houses, and about 18,000 inhabitants; only about 50 houses were of brick, the rest were of timber. The palace of the governor-general, the medical institution, the grammar-school, and the hall of the American Company, are buildings which would be ornaments to any town in Europe. Besides the grammar-school, in which the Chinese and Japanese languages are taught, there is a seminary for the clergy, and another in which young Toongooses and Buriates are instructed for the purpose of becoming teachers in their tribes, a public library, a museum of natural history, a military school, and a school for navigation. Irkutsk is the centre of the commerce of Eastern Siberia, as the commerce with China at Kiachta and Maimatshin is carried on by the rich merchants of this town, who send the goods obtained at these places to Tobolsk, Moskwa, and Petersburg; and as the American Company has here its principal dépôt, from which the eastern coasts of Siberia and the Russian settlements in North America [North-Western Territory] are provided with flour and other necessaries, and to which they send their furs. The place is 1240 feet above the sea-level, and the climate is very cold; but it is healthy and pleasant, owing to the dryness of the atmosphere. At Telma, north-west of Irkutsk, is a considerable manufacture of cloth, a smaller one of linen, and some glass-houses. From Irkutsk a road leads north-east over the mountain-pass of Baghendaisk, which is 1665 feet above the sea, to the village of Kotshuga on the Lena, where the goods are embarked that are destined for the province of Yakutsk and the American settlements. Kotshuga is 1503 feet above the sea-level. In the country south of Lake Baikal is Verchnei Udinsk, on the river Uda, not far from its confluence with the Selenga; it has about 4000 inhabitants, who are engaged in commerce with Kiachta and Nertshinsk. At Selenginsk, a small place, there is an English missionary establishment for converting the Buriates. West of it, in a steppe, is the seat of the Khamba Lama, the chief of the Buddhist religion among the Buriates: like the Dalai Lama in Tibet, the soul of the Lama is supposed to pass into his successor. Close to the boundary of the Chinese empire is the commercial town of Kiachta with Troizko Sawsk. [Kiachta.] In Da-uria is the town of Nertshinsk, at the confluence of the river Shilka with the river Nertsha, a miserable place with 1000 inhabitants. Not far from the banks of the river Argun is Nertshinskoi Sawod, with 3600 inhabitants, the seat of administration for all the mines of this district. Zuruchaitou, on the river Argun, was once a place of some importance when the commerce between Russia and China passed through it, before the new road through Kiachta and Maimatshin was established; it is now in ruins.

3. The province of Yakutsk extends over all the north-eastern part of Siberia, from the Anakara and Vitima rivers eastward to the country of the Tshooktshes, with the exception of the coast of the Sea of Okhotsk and the adjacent mountain-ranges, which constitute the province of Okhotsk. Grain is only cultivated in the vale of the Lena as far as Yakutsk; but the crops are uncertain, owing to the shortness of the warm season. It is stated that barley is grown on the banks of the Omekon, one of the upper branches of the Indighirka. The population is most dense between 61° and 63°, in the vale of the Lena, the country about the lower course of the Aldan, and in the basin of the Vilui. In the latter there are mines of excellent iron. Cattle and horses are numerous in these parts; but in others they are few, and north of the polar circle there are scarcely any. In these parts the inhabitants obtain their subsistence by fishing and hunting. The most numerous and most wealthy tribe are the Yakutes, who are breeders of cattle, horses, and sheep. The Toongooses are only hunters, and the most wandering of all the tribes of Siberia. The Yookahires and Koriakes live partly by the produce of their fishing, and partly on their herds of reindeer and by the chase. The capital is Yakutsk, on the west bank of the river Lena, with more than 4000 inhabitants. From this place the road to Okhotsk leads over the Aldan Mountains, where it rises to 2750 feet above the sea-level. Yakutsk is one of the best markets in Siberia for furs, especially sable, as this animal is very abundant in the wilderness south of the road leading to Okhotsk, and the fur is of the best quality. In the northern districts are some places, as Ust Yansk and Nishnei Kolymsk, to which the native tribes resort to exchange their furs for flour, tobacco, and other articles.

4. The province of Okhotsk extends along the sea of that name, from the innermost corner of the Bay of Penshinsk to 58° N. lat., comprehending the lower coast and the mountains at the back of it. The inhabitants are Koriakes and Toongooses, among whom a few Yakutes are settled who rear cattle. The two first-mentioned tribes live by fishing and hunting, and have only herds of reindeer. There is no cultivation here. The capital is Okhotsk. [Okhotsk.] At the most northern recess of the Bay of Ishiginsk, one of the great inlets of the Sea of Okhotsk, is the small town of Ishiginsk, with 500 inhabitants, who live chiefly on the produce of their fishery, but have also some commerce with the Koriakes.

5. The province of Kamtchatka. [Kamtchatka.]

Manufactures.—The number of manufacturing establishments is not great, if we except tanneries, which are rather numerous in some of the larger towns, as Tobolsk, Tioomen and Yeneseïsk, and the iron-foundries in the towns at the base of the Ural Mountains, in which several kinds of utensils are cast, and also cutlery is made. There are also a few glass-houses at Yeneseïsk, and at Telma, near Irkutsk. Though their number is small, the produce seems to be equal to the demand, as that kind of mica which is called Russian glass is in general use in all the smaller towns, and even in most houses of the larger towns. To these manufactures may be added coarse woollen stuffs and linen. An article of export is made at Ekatarinburg by the jewellers and cutters of precious stones. Notwithstanding the small number of manufactures, the importation of manufactured goods from Europe is inconsiderable, which is also the case with those from China, Songaria, and Bokhara, which consist only of a small quantity of silks, nankins, and other coarse cotton goods. The is the effect of the climate, which the manufactured goods of foreign countries do not suit. During nine months in the year the dress of the poor, as well as of the rich, consists of furs or sheep-skins, or the hides of the reindeer prepared in a peculiar way; and it is in the manufacture of these objects that the nomadic nations, especially the Samoyedes and Ostyaks, excel. Accordingly they not only sell their furs to their more southern neighbours, but also dresses made of reindeer-skins, and boots made of the skin that covers the feet of these animals, which is cut into narrow thongs, and then twisted with great ingenuity. The Russians and the Turkish tribes use a coarse brown cloth, which is made at home, and is not often brought to market, except in a few large towns. The Turkish tribes also use a kind of coarse carpet made of cow's hair.

Commerce with Foreign Nations.—Though the ocean washes the northern and eastern sides of Siberia, this country has no maritime commerce. The extremities of the Polar Sea are indeed free from ice for a few weeks in the summer, and small vessels might venture to navigate these parts, which indeed is done occasionally, as vessels go from Archangel to the mouth of the Obi and Yenesei, though they are generally dragged over the peninsula which separates the Gulf of Kara from that of the Obi. But the whole sea that washes the coast between the mouths of the Yenesei and North Cape (180° long.) cannot be navigated. This circumstance deprives Siberia of most of the advantages which it otherwise would derive from the navigation of the large rivers which fall into the Polar Sea. The Sea of Okhotsk may be navigated for about five months, the harbours being frozen over about seven months in the year; but this navigation is of little advantage to Siberia. The country which extends along the shores of that sea, in some parts to a distance of 500 miles inland, in others of nearly 1000, is an elevated tract covered with ridges of mountains, and does not supply the least object of commerce, except the furs of some wild animals. Being almost a wilderness, and producing very little food for man, it renders the transport of goods from the interior of Siberia to the Sea of Okhotsk very expensive. Accordingly nothing is sent from Okhotsk to Yakutsk and the interior of Siberia, except the furs which are collected by the American Company in the Russian settlements of North America; and nothing is carried from Yakutsk to Okhotsk except a few necessaries, chiefly flour and tobacco; and the price of these articles is generally increased fourfold by the expense of the transport.

But Siberia carries on an extensive commerce with Russia, Bokhara, Tashkend, and China. The most important is the trade with Russia. The transport of the goods is effected by a road which leads from Perm in Russia to Ekatarinburg and Tobolsk. West of Ekatarinburg it crosses the Ural Mountains by a mountain-pass, the highest part of which, near Bilimbayewsk, is 1698 feet above the sea. By this road the produce of the rich mines of Siberia is brought to Europe, as well as a great quantity of furs, and some leather and skins, which are chiefly collected among the nomadic tribes of the northern districts. The last-mentioned article, and the goods brought from Kiachta, consisting of tea, and some silks and cottons, go to the great fair of Nishnei Novgorod, where the Chinese goods in 1838 were estimated to amount to 18,000,000 rubles, or 787,500*l.*, and the furs to 7,500,000 rubles, or 328,145*l.* The returns consist of several articles of Russian and English manufactures, partly for the consumption of the country, and partly for sale to the Chinese at Kiachta.

The commerce which is carried on at Kiachta with the Chinese has been noticed under KIACHTA. We shall only add that, according to information obtained by Erman, the quantity of tea imported at that place in 1829 was estimated at between 5,600,000 and 6,000,000 lbs., of the value of from 1,680,000*l.* to 2,000,000*l.* Tea seems to be more used in Siberia than in England. There were also imported about 320,000 pounds of tea in cakes, valued at 45,000*l.* This tea is chiefly consumed by the Mongol tribes, the Buriates and Calmucks, and the Tartars. The second article of importance was that kind of coarse cotton-stuffs which is called *kataïka*, and is extensively used by all persons of Russian origin born in Siberia. Erman does not state the amount of this article. The third article is rhubarb, of which about 400,000 lbs. are imported, and valued at 90,000*l.* No estimate is given respecting the other articles, cottons, silks and satins, and some minor objects; but from the statement of Erman it would appear that the whole money value of the imports at Kiachta can hardly fall short of 3,000,000*l.*, whilst Cochrane estimates them at only one million and a half. The chief articles of export are furs of sables, foxes, otters, wild cats, beavers, and squirrels. Of the last-mentioned article some millions of skins are imported, the greater part of which are taken on the table-land east of Lake Baikal. The Chinese buy only the most common kinds of fur: the best go to Nishnei Novgorod and Moscow, and from thence a great portion of them go to Persia and Turkey. The amount of this article is not stated. The Russians export also coarse woollen cloth made in Poland, and coarse cotton-stuffs to the value of 45,000*l.* These two articles do not go to China, but are bought for the use of the Kalkas Mongols. As the Russian copper money is worth more than the nominal value for which it is current, it constitutes at Kiachta a considerable article of export. In this commerce the wealthy merchants of Irkutsk are engaged. The goods from Irkutsk to Kiachta, and from Kiachta to Irkutsk, are conveyed, from May to November, by large vessels which navigate the Lake of Baikal and the river Selenga, and in November and December by carts on a road which passes over the high mountain-ranges that enclose the western portion of the lake called the Kultuk, and in winter by sledges on the ice of the lake itself. The greater part of the Chinese goods is afterwards sent to Western Siberia and to Europe at a comparatively small expense, nearly the whole transit being by water. The barges that convey these goods, after departing from Irkutsk, descend the Lower Angara and Upper Toongooska to the town of Yeneseisk on the Yeneseï. A little below this place the small river Kem joins the Yeneseï, which is navigable for some distance from its mouth, and to a point only 40 miles from where the river Ket becomes navigable. The goods are carried by land over this portage, and then descend the Ket until they reach the Obi, and afterwards the last-mentioned river to its confluence with the Irtish, from which point they are conveyed by water to Tobolsk. From Tobolsk they are conveyed by land over the Ural Mountains to Perm, where they are again shipped for Nishneï Novgorod and Moskow.

The inhabitants of Siberia have also some commerce with Kuldsha, the capital of the Chinese government of Ili, or of Songaria, but this is not authorised by the Chinese court, and is therefore carried on under the name and protection of one of the sultans of the Khirghis Cossacks, who inhabit the country contiguous to the Chinese boundary. The Russian caravans depart from Semipalatinsk on the Irtish, traverse the steppe of the Middle Orda of the Khirghis, pass near the western extremity of Lake Zaizang, ascend the range called Tarbagatai, at the southern base of which they reach the town of Tarbagatai, or Chugutshak, and proceeding southward traverse the mountains of Iren Khabirgan, when they reach the town of Kuldsha. The Russians export to this place only live cattle, and they receive in return a kind of cotton-stuff of good quality, called *base*, which is manufactured in some towns of Chinese Turkistan, especially at Aksu.

In modern times a regular commercial intercourse has been established between Siberia and the khanat of Khokan, by means of caravans passing through the steppes of the Khirghis Cossacks. These caravans depart from Petropawlawsk on the river Ishim, or from Semiyark, or Semipalatinsk, two small places on the northern banks of the Irtish, and follow different roads, all of which however unite at the base of the Ala-tau Mountains (near 43° N. lat.), which divide the basin of the Talas from that of the Syr Daria, or Jaxartes. After having passed over this range they proceed southward, until they reach the towns of Tashkend and Khokan. These caravans are not composed of Siberians, but of Bokharians, Armenians, and Siberian Tartars. These Tartars can proceed with their goods to the town of Kashgar in Chinese Turkestan, from which place the Russians are excluded by the Chinese government, but the Siberian Tartars are admitted. As some articles of this trade are derived from the town of Yarkhand in Chinese Turkistan, all the goods brought to Siberia by these caravans are known in the last-mentioned country by the name of Yarkhand goods. The articles imported to the above-mentioned places consist of cotton goods, neither so fine nor so well worked as those brought from Kiachta, but they are cheaper and wear better; of some stuffs made of silk and cotton mixed, and of several kinds of calicoes. Among the imports are cotton girdles called ***kushak***, which are used by the lower classes all over Siberia instead of buttons, which are not in use. The strongest kind of kushak is imported in this way, and also several kinds of dried fruit, especially apricots, grapes, prunes, pistachio nuts, and dates. But the principal articles brought to Petropawlawsk, &c. are derived from the Khirghis Cossacks, and consist of cattle and horses, of which latter the consumption in the mining district is very great, and of felts made of the hair of camels and cattle, and of coarse carpets made of wool. The articles exported from Siberia by this way are chiefly corn for the consumption of the Khirghis Cossacks, and, for the commerce with Khokan, Russian leather, otter-skins and seal-skins, woollen cloth, looking-glasses, razors and some cutlery, combs of European manufacture, and particularly large quantities of iron and copper from the Ural mines.

The commerce which is carried on between the town of Troizk, on the river Ooï, in the department of Orenburg, and the town of Bokhara, is of a similar description. The caravans, which are composed of Bokharians and Armenians settled at Bokhara, traverse the steppe of the Little Orda of the Khirghis Cossacks. This commerce was formerly much more important; for three caravans, consisting of more than 1000 camels, annually arrived at Troizk; but since the Bokharians have been permitted to go with their goods to the fair of Nishnei Novgorod, only one caravan of from 800 to 1000 camels comes annually to Troizk. Besides the articles brought from Khokan, the Bokharians import large quantities of raw cotton, and a few shawls of great value, which, according to the statement of the Russians, are made of fine and downy hair from the bellies of the camels, which is annually taken off for that purpose by very close combs. The exports from this place are also the same as those from Petropawlawsk, but guns must be added. The Khirghis Cossacks also bring to Troizk their cattle and the other goods above mentioned.

Internal Commerce.—There is a considerable commerce carried on between the southern agricultural districts and the northern, which are inhabited by nomadic nations. A great number of Russian merchants at certain periods, especially in February, visit certain places to which the nomadic nations resort, to buy from the latter their furs and other objects. The Russian merchants give in return flour or bread, and a few manufactured articles. These places of commerce are very small, but are full of people at the time of the fairs. Among these places are Oödursk on the Obi, Toorookhansk on the Yeneseï, Ust-Yansk on the Yana, and Ostronoye on the Aniuy, one of the confluents of the Kolyma. The most frequented are the first and the last.

The fair of Obdursk is attended by all the nomadic nations that live between the town of Archangel on the White Sea, and the river Yenesei, by Samoyedes, Syrianes, Ostiaks, and Vogules. They buy from the Russian merchants great quantities of ready-made rye bread, tobacco, iron saucepans, coppers, axes, knives, needles, fire-steels, and some other smaller articles: they give in exchange the furs of polar foxes, blue, grey, and white; common foxes, black, red, and white; of beavers, wolves, and polar bears; dresses made of reindeer skins; reindeer skins, reindeer flesh, and live reindeer for slaughter; with elephants' tusks, feathers, and goose-skins. It is stated, that besides the tribute paid to the crown, which consists of furs, the Russian merchants buy at this fair annually furs to the amount of 150,000 rubles, or 6563*l*.

The fair at Ostrownoye is nearly as important, as the goods obtained there are said to amount to 200,000 rubles, or nearly 9000*l*. This fair is attended by the tribes that inhabit the north-eastern peninsula of Asia, the Yookahires, Lamutes, Toongooses, Choowanzes, Koriakes, and particularly the Tshooktshes. The furs are the principal article brought by these tribes, and the greatest part are brought by the Tshooktshes from the north-west coast of America. They consist chiefly of the skins of black and silver grey foxes, of polar foxes, lynxes, gluttons, river otters, beavers, and an extremely beautiful kind of marten which is not found in Siberia. They also bring skins of the black as well as of the ice bear, and tusks and skins of the morse; the ribs of the whale, which are fixed under the sledges, as bars of iron are fixed in other northern countries, and are an important article of inland trade as far south as Yakutsk, and west as far as the banks of the Yeneseï. lastly, seal-skins, which are used as sacks and for trunks, and dresses made of reindeer-skins. The Russian merchants give in return tobacco, several kinds of iron utensils, as pots, axes, knives, fire-steels, needles, dishes and basins of copper, tin, or wood, and great quantities of beads, which are used as ornaments by the women. The Tshooktshes, most of whom have frequent dealings with the native tribes of the north-west districts of America, are in general sufficiently skilful in trading with the Russians; but they are easily cheated out of their goods when spirits are offered to them, which however are only smuggled into the country in very small quantities, as the Russian government has prohibited the importation of this article.

We have still an observation to make on the commercial intercourse of the Tshooktshes with the tribes of the north-western parts of America. That portion of the Tshooktshes who live in permanent habitations belong to the family of the Esquimaux, and seem to have emigrated from America, as the tribes that inhabit the eastern shores of Behring's Strait speak a language which differs in very few words. This circumstance must have greatly contributed to maintain an intercourse between the two continents. The island of Imaklitt, one of the group of the Diomede or Gwosdef Islands, is generally the place where the exchange of goods takes place. The most active merchants are the American inhabitants of the two small islands called King's islet or Ookivok and Asiak or Ajak, especially those of the last-mentioned island, who dispose of the Russian goods which are obtained from the Tshooktshes along the coast of America, as far south as the peninsula of Aliaska, and would probably carry them still farther to the east, if the settlements of the American Company did not provide the tribes in those parts with such articles. The Tshooktshes, as well as the Americans, visit the island of Imaklitt in summer in their boats call *baidares*, which are made of whale-bone, and in winter in sledges which are drawn by dogs. The Tshooktshes bring tobacco, some iron utensils and ornaments obtained from the Russians, with a considerable number of reindeer dresses, as this animal does not appear to be common in any part of North America. The Asiakmutes, or inhabitants of the island of Asiak, bring the various furs above mentioned, and a great number of morse-tusks. The American tribes which inhabit the country north of Cape Prince of Wales, as far as Icy Cape, also visit the island of Imaklitt to obtain Russian goods. The knowledge of the extensive commerce thus carried on between the two continents by savage tribes, which we owe to Wrangel, explains how the iron pots and knives which Captain Beachey found among the inhabitants of Icy Cape, and the knives which Franklin saw on the northern coast of America, and which were all of Russian manufacture, found their way to these remote places.

History.—Europeans had not the least knowledge of the existence of Siberia up to 1580. It is however certain that a part of it was conquered by Gengis Khan and his successors; for it appears that the Buriates were subjected to the Kalkas Mongols by that conqueror; and when the Cossacks had passed the Ural Mountains, they found that the country on both sides of the river Irtish was subject to Kutshum Khan and his Tartars or Turks. It is very probable that this sovereignty had been established in these parts when those of Casan and Astrakhan were founded on the west and south of the Ural Mountains. During the war by which the Czar Iwan Vasilievitsh made himself master of the khanat and town of Casan (1552), the countries contiguous to the western base of the Ural Mountains had fallen into great disorder, and were filled with robbers. The sovereign of Moscow made every effort to re-establish order in these countries by punishing the authors of the disturbances. Among them was a Cossack called Yermak Timoféyew, who for a long time had robbed the vessels that navigated the Volga, and had a considerable number of accomplices. Seeing the energy with which the Czar pursued the robbers, he turned his thoughts to the East, and in 1580 he passed the Ural Mountains with his small army, and entered the territories of Kutshum Khan, and by his activity, energy, and military skill, within two years he had taken the town of Tshingistora, now called Toomen, and the residence of the khan, called by the natives Isker, but by the Cossacks, Sibir, from which the country was afterwards named. He then ventured to offer his conquest to the Czar, on the condition of a free pardon, which of course was granted. He continued his conquests with effect until he was drowned in the Irtish in 1584.

After his death his conquests were lost to Russia, but the power of Kutshúm Khan had been broken, and he was unable to resume his former position. The Russians continued gradually to gain on him, until his empire was entirely destroyed, and all the country west of the river Obi was subjected to the sway of the Czar. In 1604 the town of Tomsk was built, which constituted a fresh point from which the bold spirits of the age might proceed farther east. Their first attempts were successful, but as the country south and east of Tomsk was better peopled than other parts of Siberia, and the mountains to the south were then in the possession of the powerful and warlike tribe of the Eastern Khirghis, they were soon checked in their enterprises. In 1614 the different Turkish tribes that inhabited those parts, joined by the Khirghis, rose against the inhabitants of Tomsk, laid waste the whole country to the very gates of the town, and besieged the city itself. No succour could be sent from Europe, as Russia was then in great internal disorder, owing to the unsettled state of the country after the death of Boris Godoonoff, and the wars which preceded the accession of the family of Romanoff to the throne of Russia. But the inhabitants of Tomsk maintained their footing, though their progress for some time was retarded; and several years afterwards, when the Eastern Khirghis, in despair of resisting the Cossacks, left the country and emigrated to the west, the progress of the Russians was very rapid. Small parties of adventurers, issuing from Tomsk, advanced to the banks of the Lake Baïkal, entered the basin of the river Lena, where they subjected, though not without considerable difficulty, the powerful nation of the Yakutes, and after passing the Aldan Mountains, reached the Sea of Okhotsk in 1639. Thus, in a period not exceeding sixty years, the Russian arms advanced from the Ural Mountains to the shores of the Pacific Ocean. But all Siberia was not so easily subjected. The populous nation of the Buriates had been attacked and partly conquered in 1620, but they frequently rebelled, and their complete submission was not effected before 1658. Soon afterwards the town of Irkutsk was built by Iwan Pochaboff (1661). Thus the whole of Siberia, with the exception of Da-uria, was subjected to Russia in about eighty years, without the government having been at the least expense; for all these wars had been undertaken and brought to successful issue by private adventurers, mostly Cossacks, who were induced to such undertakings by the desire of plunder and by their roving habits. Their success must certainly appear wonderful, when it is considered that they were without the least education, and that they nearly always proceeded to those undertakings without having previously concerted any plan. The conquest of Da-uria was completed in the same way. Khabarow, a Pole by birth, had escaped from Yeneseïsk with a few exiles, and after wandering about for some time in the woods which surround Lake Baïkal, he and his followers settled, beyond the present boundary of Siberia, on the Amur, in 52° 9′ N. lat., where they built a small fortress, called Albasin. As they had offended their neighbours, some tribes of Toongooses, they feared they might be overpowered by numbers, and, like Yermák, offered their conquest to the emperor of Russia, soliciting at the same time his forgiveness for their offences. Meanwhile the Toongooses had applied to the Chinese for assistance. In 1684 an army composed of Mandshoos and Chinese appeared before Albasin and took it, but permitted the Russians to go to Nertshinsk, which had been built in 1658, when the Buriates were completely subjected. But the Russians returned the following spring and rebuilt Albasin. A Chinese army however came again in the month of July, took the place after a stout resistance, and sent a considerable number of the prisoners to Peking. These events caused a dispute between the courts of Peking and Petersburg; but by the intervention of the Jesuits who resided at Peking, a treaty was concluded in 1589, by which the present boundary between Siberia and the Chinese empire was firmly established. This treaty was confirmed by the treaty of 1727, in which Kiachta and Maimatshin were appointed as the only places where a commercial intercourse between the two countries should take place. At the same time Russia obtained permission to send every ten years a spiritual embassy to Peking, in order that the prisoners taken at the last conquest of Albasin, and their offspring, might receive instruction in their religion.

(Pallas, *Reisen durch verschiedene Provinzen des Russischen Reiches*; Georgi, *Beschreibung der Bewohner des Russischen Reiches*; Fischer, *Sibirische Geschichte*, Petersburg, 1768; Sauer's *Account of a Geographical and Astronomical Expedition to the Northern Parts of Russia, performed by Billings*; Humboldt's *Fragmens Asiatiques*; Sarytcheff's *Account of a Voyage of Discovery to the North-east of Siberia*; Klaproth's *Magazin Asiatique*; Cook's *Third Voyage to the Pacific Ocean*; Eversman's *Reise nach Buchara*; Ledebour's *Reise in den Altai*; Cochrane's *Narrative of a Pedestrian Journey through Russia and Siberian Tartary*; Erdman, *Beiträge zur Kenntniss des Innern von Russland*; Kotzebue's *Voyage of Discovery into the South Sea*, &c.; Beechey's *Voyage to the Pacific*; Erman, *Reise um die Erde*; Rose, *Reise nach dem Ural, dem Altai, und dem Caspischen Meere*; Wrangel's *Reise längs der Nordküste von Sibirien und auf dem Eismeere*, and *Statistische und Ethnogr. Nachrichten über die Russischen Besitzungen in Nord America*; Baer *on the Ground-Ice or Frozen Soil of Siberia*, in 'London Geog. Journ.,' vol. viii.; and Ritter, *Erdkunde von Asien*, vols. i. and ii.)

SIBTHORP, JOHN, the youngest son of Dr. Humphrey Sibthorp, professor of botany at Oxford, was born in that city Oct. 28, 1758. He took his master's degree in 1780, and afterwards obtained a Radcliffe travelling fellowship. In 1783 he took the degree of M.B.; and, leaving Oxford for a time, pursued his medical studies at Edinburgh. He next visited France and Switzerland, and made some interesting botanical discoveries at Montpellier, which he communicated to the Academy of Sciences in that city.

In 1784 he returned to England, and having taken the degree of Doctor of Medicine, was appointed to succeed his father, who had resigned the professorship of botany. Part of the same year was spent at Göttingen, where he formed the plan of his voyage to Greece, which soon after he executed. His object being to study the botany of that country, which had been so little investigated by the moderns, he engaged at Vienna Mr. Bauer, an excellent draughtsman, with whom he set out on his expedition, in March, 1786. In the autumn of that year he visited Naples and Crete, and wintered at Constantinople. In the spring of 1787 he visited Cyprus and other Greek islands, and touched at the coast of Asia Minor. In June, 1787, he made some stay at Athens, in order to recover his health, which had been much impaired by the heat of the weather and by confinement on ship-board. From that city he made excursions to various parts of Greece; and embarking at Patras on September 24th, 1787, reached England, after a tempestuous voyage, during the first week in December.

He now enjoyed some years of learned leisure, engaged in the duties of his professorship, and in superintending the labours of his draughtsman. He was one of the first members of the Linnæan Society, and became a fellow of the Royal Society in 1789. His reputation gained him an increase of his stipend, with the title of Regius professor, which was conferred on him in 1793. But nothing could deter him from attempting to accomplish his purpose of forming a complete Flora of Greece. Accordingly, in March, 1794, he set out on his second journey to that country. He now examined the Troad, paid a second visit to Mount Athos, and spent two months at Athens. He passed the winter of 1794 at Zante, where an apothecary furnished him with a complete Herbarium of the island. In February, 1795, he left Zante for the Morea, where he remained for two months, and returned to Zante at the end of April. He here embarked on board a vessel bound for Otranto. The voyage, which is usually accomplished in five days, occupied more than three weeks; and the inclemency of the weather to which Dr. Sibthorp was exposed hastened the progress of a consumption, of which he had before experienced the symptoms. In the autumn of 1795 he reached England: his health now grew rapidly worse; and on February 8, 1796, he died at Bath, in the thirty-eighth year of his age.

Of the value and extent of Dr. Sibthorp's labours, some notion may be formed from the fact that the number of species collected from his manuscripts and specimens amounts to three thousand. Unhappily, he lived to finish only one work, a 'Flora Oxoniensis,' published in 1794. In his will he bequeathed to the University of Oxford an estate of 200*l.* a year, for the purpose of publishing his 'Flora Græca,' in ten folio volumes, with a hundred plates in each; and a prodromus of the work, without plates. [Dioscorides.]

SIBTHO'RPIA, a genus of plants named after Dr. Humphry Sibthorp, formerly professor of botany at Oxford, the successor of Dillenius, and the father of Dr. John Sibthorp. [SIBTHORP.] This genus consists of small creeping, rooting, tufted herbs with small alternate uniform leaves, a 5-parted calyx, 5-lobed subrotate corolla, 4-5 nearly equal stamens, a capitate stigma, and a suborbicular capsule dehiscing at the top. The flowers are axillary, solitary, and inconspicuous. One of the species, *S. Europæa*, is a native of Europe, and is found in Portugal, Spain, and France, and in Devonshire and Cornwall in England. This genus is referred by most botanists to the order Scrophulariaceæ; but it differs from this order in its globose placenta and regular flowers. It differs from Primulaceæ in its stamens, being alternate with the lobes of the corolla, and in its capsule being 2-celled; hence Don has proposed to place this and some other doubtful genera in a new order, Sibthorpiaceæ, which possesses characters intermediate between those of Scrophulariaceæ and Primulaceæ.

SIBYL (Σίβυλλα) is the name by which several prophetic women were designated, all of whom belong to the mythical ages of antient history. But Pausanias (x., c. 12), who gives an account of the sibyls, applies the same name to female soothsayers of the historical times. (Strabo, xiv., p. 645.) In more correct language however the name is only applied to mythical personages. It was believed that the sibyls were maidens who possessed a knowledge of the future, and of the manner in which evils might be averted, and especially of the manner in which the wrath of the gods might be appeased, and that they communicated their knowledge in inspired verses. They acquired their knowledge by direct inspiration. (Varro, *ap Lactant.*, i. 6; Cic., *De Div.*, i. 2; Plat., *Phaedr.*, p. 244.) The number of such prophetesses appears to have been very great in antient times, and we know of Egyptian, Hebrew, Persian, Babylonian, Greek, and Italian sibyls. Varro enumerates ten sibyls, while others only knew four. (Ælian., *Var. Hist.*, xii. 35; comp. Suidas, *v.* Σίβυλλα.) Varro however appears in some cases to make two sibyls out of two epithets belonging to the same person, while on the other hand he does not mention the Hebrew sibyl, Sabbe. (Paus., x. 12, 5.) We shall in this article only mention the most celebrated sibyls.

The most antient sibyl was Herophile, a daughter of Zeus and Lamia (Paus., x. 12, 1), probably the same who is called by Varro the Sibylla Libyca. The Erythraean sibyl was supposed to be a native of Babylonia, but some thought that she was born at Erythrae. She lived before the Trojan war, the cause and issue of which she was believed to have predicted. (Varro; Paus., x. 12, 1.) In the time of Pausanias, a hymn on Apollo was very familiar to the inhabitants of Delos, which was attributed to this sibyl. In this hymn, a fragment of which is preserved in Pausanias, she calls herself the daughter of one of the Idaean nymphs and of a mortal. The Samian sibyl was supposed to have been a priestess in the temple of Apollo Smintheus. She spent the greater part of her life in Samos, but, like most other sibyls, she is described as travelling about and communicating to men her inspired wisdom. Thus we find her at Claros, Delos, and Delphi. She is said to have died in Troas, where a monument was erected to her in a grove sacred to Apollo Smintheus. The inscription of this monument is preserved in Pausanias (x. 12, 3). Cumæ in Ionia was also celebrated for its sibyl; but the sibyl of Cumæ in Campania, called Demo, has acquired more celebrity than any other. The antient legend about her is related by Virgil (*Æn.*, iii., 441, &c.). In the reign of Tarquinius Priscus, or, according to others, in that of Tarquinius Superbus, there appeared before the king a woman, either herself a sibyl or sent by a sibyl, who offered to the king nine books for sale. The king refused to purchase them, whereupon the woman burnt three of the books, and returning, asked for the remaining books the same price as she had asked for the nine. The king again declined purchasing; but when the woman, after burning three books more, returned and asked for the three remaining the same price which she had before asked for the nine, his curiosity was excited, and he purchased the books; whereupon the strange woman vanished. These three books were the Sibylline Books which play such a prominent part in the history of Rome: they contained the 'fata urbis Romæ.' (Dionys., iv., p. 259; Varro, *ap Lactant.*, i. 6; Gellius, i. 19; Plin., *Hist. Nat.*, xiii. 27.) Now who this sibyl was, is differently stated. Some of the antients represent her as the Erythraean sibyl, others say that she had come from Cumæ in Ionia, and others that she was the sibyl of the Italian Cumæ. Modern writers are likewise divided in their opinions. Niebuhr (*Hist. of Rome*, i., p. 506) thinks that it was the Ionian prophetess; but his arguments are not convincing, and it is by far more probable that the sibylline oracles of the Romans were derived from the neighbouring town of Cumæ in Campania. (Hartung, *Die Relig. der Römer*, i., p. 129, &c.; Göttling, *Gesch. d. Röm. Staatsv.*, p. 212.) The Sibylline Books, which were henceforth in the possession of the Roman state, are said to have been written on palm-leaves, partly in verse and partly in symbolical hieroglyphics. The public were never allowed to inspect them, but they were kept in the temple of Jupiter Capitolinus, where they were preserved in a stone chest in a subterraneous vault, and under the care of especial officers (duumviri sacrorum, interpretes, or sacerdotes sibyllae), who had been appointed by the Tarquinius who purchased the books. These officers had to consult the Sibylline Books (adire libros sibyllinos) on all occasions when the gods manifested their wrath by inflicting calamities upon the Romans, and when human help and human wisdom were not thought capable of averting their anger. The answers which were derived from them were almost invariably of a religious nature, as they either commanded the introduction of some new worship, or the institution of new ceremonies and festivals, or the repetition of old ones. But during the time of the republic, they do not seem to have ever been used, like the Greek oracles, as a means to ascertain the future, or what political measures were to be adopted in order to attain a certain political object. The manner of consulting them, as Niebuhr and others suppose, was probably the following:—they opened the volumes at random, and whatever passage first met their eye was thought to contain the suggestions adapted for the present case. The keepers of the Sibylline Books were at first only two, with two attendants; and one of the first duumviri appointed by Tarquin was condemned by the king to suffer the punishment of a parricide for blabbing. (Dionys., iv., p. 260; Val. Max., i. 1, 13.) After the banishment of the kings the two keepers of the Sibylline Books were appointed by the people, probably in the comitia centuriata, for life. They were exempt from all civil and military offices; and whenever they had to consult the sacred books, they were authorised by a senatus consultum, and they consulted them in the presence of their attendants. The numbers of these priests was afterwards, perhaps in the year B.C. 368, increased to ten, and half of them were to be plebeians: in the time of Sulla their number was increased to fifteen.

In the year 83 B.C. the temple of Jupiter, on the Capitol, was burnt, and the Sibylline Books were consumed by the flames. In order to restore the books, the senate sent ambassadors to various towns of Italy, Greece, and Asia Minor, to collect Sibylline oracles, both from public and private sources. These ambassadors collected about one thousand verses, which were again kept in the temple of Jupiter, after it had been restored. (Dionys., iv., p. 260.) This collecting and restoring the antient oracles brought to light a great many spurious ones, and rendered the people more familiar with these oracles than they had been before, and the superstition of the time made great abuse of them. Augustus therefore ordered that on a certain day all Sibylline books which were in the possession of private persons should be delivered up to the praetor urbanus, and burnt. On this occasion more than two thousand such books were delivered to the flames; and those oracles which were in the keeping of the state, and were considered to be genuine, were now deposited in two gilt chests in the temple of Apollo, in the base of his statue, and entrusted, as before, to the quindecimviri. (Suet., *Aug.*, 31; Tacit., *Annal.*, vi. 12.) Whether this collection was not made with sufficient discernment, or whether the keepers contrived to introduce new or spurious verses, is not clear; but, some years afterwards, Tiberius found it necessary to institute a fresh examination of the Sibylline oracles, and to strike out many which were considered to be spurious. (Dion Cass., lvii., p. 705, Steph.) Not many years afterwards a proposal was made to add a new volume of Sibylline prophecies to the authorised collection. (Tacit., *Annal.*, vi. 12.) In the reign of Nero the Sibylline Books were burnt a second time, but were again restored, and used as before. In the year 270 A.D. several members of the senate advised to consult them respecting the issue of the war against the Marcomanni. (Fl. Vopisc., *Aurel.*, 1 About this time the Christians, in their zeal to convert the heathens, began to refer to the Sibylline oracles as containing prophecies respecting the Messiah; and such prophecies may have been found in them, either owing to the vagueness of the oracles, which might be applied to any circumstances, or it may be that at this time a number of Sibylline oracles were forged and circulated. The collection which was in the keeping of the state was burnt a third time in the reign of Julian (A.D. 363); and a fourth time in the reign of Honorius, by Stilicho, A.D. 395. (Rut., *Itin.*, ii. 51.) But it was restored each time; and notwithstanding all the forgeries which must have crept into it, the collection continued to be held in great esteem, as it was a useful instrument in the hands of the various parties, political as well as religious. Hence we find them consulted even as late as the middle of the sixth century of our æra.

A complete collection of Sibylline verses was compiled and edited by Gallæus, Amsterdam, 1689, 4to.; but it contains a great many spurious verses, and such as were made by the early Christians who pretended to be inspired. In 1817 A. Mai published a collection of fragments from the Sibylline Books, which he discovered in a MS. of the library at Milan. Another collection of fragments was published by C. L. Struve, under the title 'Sibyllinorum Librorum Fragmenta,' Regiomont., 1818, 8vo.

SICARD, ROCH AMBROSE CUCURRON, was born at Fousseret, near Toulouse, on the 20th September, 1742. He completed his studies at this city, and entered into holy orders; but while thus engaged he felt impelled to enter upon a new career, for which, as his success afterwards proved, he was peculiarly adapted. The archbishop of Bordeaux wished to establish a school for the deaf and dumb, and he fixed upon the Abbé Sicard to second his project, who went to Paris to learn the method of instruction there pursued by the Abbé de l'Epée. He returned to Bordeaux in 1786, and the new establishment prospered under his care. This success obtained for Sicard new preferment, under the title of vicar-general of Condom, with that also of canon of Bordeaux. Very eager for honorary distinctions, the vanity of Sicard was flattered by the attentions paid to him: he became a member of numerous academies and literary and scientific societies, and he felt pleasure in assuming the titles thus conferred upon him. These literary honours did not however cause him to relax in his zeal for the education of the deaf and dumb, in which pursuit he became so distinguished that public opinion pointed to him as the most worthy to be the successor of the Abbé de l'Epée, who died in 1789. To obtain this honourable office it was necessary that the candidates should undergo an examination before a commission from the three academies named by the king. Three candidates entered into competition with Sicard: the Abbé Salvan, instructor at Riom in Auvergne, afterwards a joint director at the institution for the deaf and dumb at Paris; Father Perronet, an Augustine; and the Abbé Masse, to whom the commune of Paris had temporarily entrusted the management of the institution. The last-named candidate did not submit to the examination, and after a minute investigation into the acquirements of the other three, Sicard was chosen, and the choice of the commissioners was confirmed by Louis XVI., in April, 1790.

The establishment at Paris was supported during the latter part of the Abbé de l'Epée's career by the government. From 1778 to 1785 a decree of the council had secured a revenue of 240*l.* (6000 livres) from the estate of the suppressed convent of the Celestines for the institution of the deaf and dumb, which only ceased when the National Assembly declared the confiscated possessions of the antient monasteries to be national property. In July, 1791, the Assembly granted a donation of 12,700 francs (508*l.*) to the institution, which was then removed to the convent of the Celestines. Since then it has been removed to the buildings of the seminary of St. Magloire, where it still continues. In 1791, though the oath affirming the civil constitution of the clergy was not required from Sicard, he was willing to acknowledge liberty and equality, and this acknowledgment he accompanied with a gift of 200 livres. Notwithstanding this concession, he was arrested on the 26th of August, and confined till the 2nd of September. On this occasion, the pupils of Sicard addressed to the Assembly an eloquent petition, which demonstrated the intelligence which Sicard had called forth in them. This petition was presented by Sicard's most celebrated pupil Massieu at the bar, and read by one of the secretaries: it was highly applauded, and a decree was made, directing the minister of the interior to give an account of the cause of Sicard's arrest. Other matters caused this decree to be disregarded, and on the 2nd of September Sicard was transferred to L'Abbaye; at that time this was like a sentence of death. During the two following days Sicard felt the danger of his position, which he has narrated with great prolixity. The weapon of the executioners was already raised over Sicard, when a watchmaker named Monnot placed himself before the intended victim, saying, 'It is the Abbé Sicard, one of the most useful men in the country: you shall run through my body to get at his.' Sicard then said, 'I am the instructor of the deaf and dumb; and as these unfortunates prevail more among the poor than the rich, I am more to you than to the rich.' This address produced such an effect, that the murderers embraced him, and proposed to take him home in triumph. An affected scruple of justice prevented him from allowing this to be done: he said he had been imprisoned by a constituted authority, and to that authority alone could he look for his freedom. During two days and two nights he remained in prison, in imminent danger of being massacred. He wrote to the president of the Assembly stating his situation, and the devotion of Monnot, and a decree was made declaring that this brave man deserved well of his country. But the commune of Paris, though apprised of the interest Sicard excited, passed on to the order of the day. On the 4th of September Sicard knew that he was to be sacrificed that evening; and it was only by the decisive steps taken by several of his friends in the Assembly to whom he wrote that his life was saved. Even on his release, so great was his desire of popular applause, that, instead of retiring in quietness to his pupils, he went to the Assembly, accompanied by his preserver Monnot, to exhibit himself, and to thank those who had been instrumental in his deliverance.

After his restoration to his pupils, he did not experience further persecution, but occupied himself solely with them during the reign of terror. After the fall of Robespierre, when the National Convention took up some useful projects, a normal school was created, in which Sicard was appointed a teacher of grammar. In his first lecture, in 1795, he extolled philosophy so highly when applied to education, as to leave religion nearly out of the question. On another occasion he analysed grammatically the following phrase: 'Frenchmen should rally round the Convention, which will persecute the disaffected, to whatever party they belong.' He contended against the revolutionary freedom of thou-ing and thee-ing, and contributed with Laharpe to banish its use from the normal schools. His scientific course had great success, which is to be less attributed to his grammatical innovations, than to the simple and ingenious manner in which he submitted the forms of grammar to the operation of analysis. His lectures were much frequented, and occasionally by Garat, Volney, Wailly, and others. He was soon after engaged in contributing to and otherwise assisting in the publication of political and religious papers in various periodicals, and was brought under the notice of the Directory, and banished. It was a considerable time, and only after humiliating submissions, that he was restored to his pupils. But the establishment had been neglected during his proscription, the resources had been cut off, and the ceremonies of religion forbidden. This state of things was changed on his return. He set up a printing-press in the Institution, had his own works printed by the pupils, and from that time employed himself solely in perfecting the methods of instruction transmitted to him by his illustrious predecessor. The Abbé de l'Epée had translated things by signs, and signs by words, and he had applied his system only to physical objects: in explaining intellectual things and operations he adopted the reverse of this order; he taught them the verbal expressions first, and then explained these by signs. In the latter operation the eyes and memory only of the pupils were exercised; the words conveyed no knowledge to their minds, and consequently the signs for them were without meaning. Sicard applied De l'Epée's process for material objects to metaphysical ideas also, and thus succeeded in giving to his pupils that development of intellect of which he found them capable. The public examinations of his pupils contributed to extend his reputation; on these occasions he exhibited successively his favourite pupils, Massieu, Clerc, and Berthier. Foreigners crowded to these examinations, which were also attended by many persons of the highest distinction. The chief works of Sicard are his 'Théorie des Signes,' 'Cours d'Instruction d'un Sourd muet de Naisance,' and 'Eléméns de Grammaire Générale appliquée à la Langue Française.' He wrote and translated several other works, and he was a member of most of the learned societies of his time. In 1815 he visited England with Massieu and Clerc, and was very honourably received and noticed. The old age of Sicard was not one of ease and plenty, though his life had been passed in assiduous labour, for he was involved by his good nature in becoming responsible for the pecuniary engagements of others, and was consequently obliged to put his expenses on the most economical scale. His death took place in May, 1822. Three funeral orations were pronounced to his memory; one of them was by his unfailing friend M. Lafond de Ladébat, in the name of the Directors of the Institution for the Deaf and Dumb.

(*Biographie Universelle.*)

SICILIES, TWO, UNITED KINGDOM OF THE, *Regno Unito delle Due Sicilie*, the title of an Italian monarchy, which comprises the southern part of the peninsula, being nearly one-third of continental Italy, and also the island of Sicily. It is the largest and most populous of the Italian States. The area of the kingdom has been variously estimated, but there has been hitherto no trigonometrical survey of the whole, though a commission of engineers is at present employed on a survey. According to an admeasurement made on the map of Rizzi Zannoni, which, though not faultless, is the best general map of the kingdom, the area of the Continental territories would be about 23,000 Italian square miles, the Italian mile of length being 60 to one degree of latitude. If to this we add about 7700 miles for the area of Sicily, the total area of the united kingdom will be 30,800 Italian square miles, or about two-thirds of the area of England. In 1837 the population amounted to above eight millions, of which six millions were in the Continental territories, and about two millions in Sicily. In the administrative language the Continental territories are styled 'Dominj di quà dal Faro,' while Sicily is designated as 'Dominj di là dal Faro.' Writers also use the denomination of Sicilia Citeriore and Sicilia Ulteriore, the designation having reference to Naples, the capital. A geographical and statistical account of each of these two great divisions is given under Naples, Kingdom of, and Sicily.

In the present article we propose to give a brief sketch of the history of the country, and an account of the present system of government.

The Sicilian monarchy originated with the Norman conquest of Sicily and Apulia in the latter part of the eleventh century. An outline of the antient history of the island of Sicily, as well as of its subsequent vicissitudes previous to the Norman conquest, is given under Sicily. With regard to the Continental provinces, which, in the ante-Roman times were inhabited by numerous nations, the Marsi, Peligni, Marrucini, Vestini, Prætutii, Frentani, Samnites, Hirpini, Campani, Lucani, Appuli, Calabri, Salentini, and Bruttii, some of which were derived from the great aboriginal Sabine stock, and other from Greek colonies, an account of their antient history and of their remains of antiquity still existing is given under Apulia; Basilicata; Calabria; Campania; Capua; Cumæ; Locri (Epizephyrii); Magna Græcia; Naples, City of; Pæstum; Pompeii; Pyrrhus; Samnites; Social War; Tarentum, &c.

Those various countries, being finally subjugated by the Romans at the end of the Second Punic War, were administered either as Municipia, Coloniae, or Praefecturae. The municipia retained their local administration and customs, but were subject to the Roman law. This was the condition of Cumæ, Acerræ, Suessa, Atella, Formiæ, Barium, and other places, most of which became colonies under the empire. The colonies were very numerous, and among others are Puteoli, Pompeii, Nola, Sinuessa, Casilinum, Calatia, Teanum, Abella, Pæstum, Buxentum, Saticula, Æsernia, Boianum, Sepinum, Sipontum, Venusia, Brundusium, Hydruntum, Lupia, Tempsa, Croton, Mamertum, Petilia, Scylacaeum, Thurium, and other places. These colonies had their civil institutions framed after the model of the great parent city Rome; they had their decuriones, decemviri, ædiles, quæstores, and other magistrates, and their public acts were designated by the term 'Ordo et Populus,' or 'Senatus Populusque' (Nolanorum, Minturnensium, &c). Several towns, which in the time of the Roman republic were free allies, 'socii,' paying merely a tribute to Rome, such as Neapolis, Nucera, Salernum, Lucera, Beneventum, Tarentum, Locri, Rhegium, became afterwards colonies, in consequence of the civil wars or under the empire, some by having a colony sent to them, others by merely having their civil institutions assimilated to those of the real colonies.

The prefectures had no laws or magistrates of their own choice, but were governed as subject towns by prefects sent from Rome. In this class were Fundi, Venafrum, Allifæ, Arpinum, Capua, and others.

Hadrian changed the form of administration in Italy, which he divided into seventeen provinces. The regions now called the kingdom of the Two Sicilies, were by this arrangement made to consist of part of the province of Campania, which embraced also Latium, and of the four provinces of Apulia and Calabria, Lucania and Bruttii, Samnium, and Sicily. Campania and Sicily were administered by 'consular' governors, the others by correctors. The government thus became more uniform and absolute, and the towns lost most of their former privileges. Constantine retained the division of provinces, and placed those of southern Italy under the superintendence of the Vicar of Rome, whilst the provinces of northern Italy were under that of the Vicar of Italy, who resided at Milan.

The Christian religion spread gradually into southern Italy during the second and third centuries of our æra, as is proved by the memorials of the martyrs who suffered at Nola and Puteoli, especially under Diocletian, but heathenism continued to prevail in most of the towns till after the reign of Constantine. Such was the case with Naples in particular, as appears by a passage of Symmachus (b. viii, Epist. 27) which is quoted by Giannone, in contradiction to the popular notion of the early conversion of the whole country to Christianity. Under the successors of Constantine the churches of south Italy and Sicily were placed under the jurisdiction of the bishop of Rome, and were called 'Suburbicariæ,' in the same manner as the corresponding provinces were, for civil matters, placed under the administration of the Vicar of Rome. Until the reign of Valentinian III., the jurisdiction of the bishop of Rome, according to Sirmond, Dupin, and Giannone, did not extend beyond these suburbicarian provinces or dioceses, of which he was the only metropolitan, and of which he ordained the bishops. The bishop of Rome was styled patriarch by the Greeks.

After the fall of the Western Empire, and the re-establishment of the Gothic prince Theodoric as king of Italy, the provinces of south Italy retained the same form of administration which they had under the Roman emperors, but the Goths introduced the practice of sending a comes or count to every town as civil governor, besides a judge to administer justice. Theodoric enacted many useful ordinances for the administration of the country, and both under him and his immediate successors Italy enjoyed peace and security.

Justinian having taken Italy from the Goths, established the office of exarch or imperial lieutenant, whose residence was fixed at Ravenna. The exarch appointed certain officers, styled dukes, to be civil and political governors of considerable towns, and thus Naples, Tarentum, Gaeta, Amalfi, Surrentum, and other places had each its duke, dependent on the Byzantine exarch at Ravenna, who also kept a military garrison in each of those towns.

Longobard Period.—The earlier Longobard conquerors did not extend their conquests beyond Spoleto; but after a few years, about 580, the precise date being a matter of controversy, a considerable Longobard force entered Samnium, and took Beneventum, where they established a duchy under one Zoto. This duchy became one of the most important in the whole dominions of the Longobards, having extended its dominion not only over the mountainous region of Samnium and the Abruzzi, but also over part of Campania, including Capua, and over a great part of Apulia. It was under duke Zoto that the Longobards, who were still heathens, about the year 582, pillaged the monastery of Monte Casino. The monks took refuge at Rome, whence they were allowed to return many years after, when the Longobards, having embraced the faith of the Western Church, not only protected the monks, but rebuilt or restored the monastery about the year 690.

The duchies of Naples and Gaeta, the towns of Amalfi and Surrentum, the peninsula of Iapygia, and part of the country of the Bruttii remained under the Eastern emperors, but in a state of almost constant war with the Longobards of Beneventum. About the year 663, Constans II. came from

Constantinople with a large armament, and landed at Tarentum with the intention of driving away the Longobards. He besieged Beneventum unsuccessfully, and his troops were defeated near Formiæ by Romuald the Longobard duke, in consequence of which, after committing many depredations, he withdrew to Sicily, where he was soon after smothered in a bath at Syracuse by one of his domestics (A.D. 668). After this, Romuald, duke of Beneventum, took from the Greeks Salernum, Barium, Brundusium, Tarentum, and most other towns on the coast (A.D. 774). Charlemagne having defeated and taken prisoner Desiderius, the last king of the Longobards, received the allegiance of all the dukes of the various provinces of the Longobard kingdom, except Arechis, duke of Beneventum, who, relying on the extent and remoteness of his territories, protected by mountains and strong passes, defied the power of the Franks, and assumed the title of an independent prince. Arechis was a man of abilities. He embellished and fortified Salernum and Beneventum; he encouraged learning, and was the friend of the historian Paulus Diaconus, who took refuge at his court. In 787 Charlemagne having come again into Italy with an army, entered the dominions of Arechis, and advanced as far as Capua. Arechis sued for peace, and agreed to pay tribute to Charles, and gave him his son Grimwald as an hostage. Arechis died shortly after, and was succeeded by Grimwald, whom Charlemagne released on condition of his acknowledging Charles as his suzerain in all public acts, and also razing the walls of Salernum, Compsa, and other places. Grimwald having eluded the last condition, Pepin, son of Charlemagne, and king of Italy, marched against him about the year 801, but was repulsed. To his summons to pay him allegiance Grimwald replied by the following distich:—

> 'Liber et ingenuus sum natus utroque parente:
> Semper ero liber, credo, tuente Deo.'

In 806 Grimwald died, and was buried in the church of Santa Sophia at Beneventum, with an inscription over his tomb, in which he is called the 'Saviour of Beneventum against the phalanxes of the Franks.' Having left no sons, his treasurer and namesake, Grimwald, styled II., was elected in his place. He made peace with Charlemagne, and agreed to pay tribute to the kingdom of Italy. After a war against the duchy of Naples, which acknowledged the authority of the Eastern emperor, Grimwald II. made peace with the Neapolitans.

About 830, the Saracens, who had taken possession of Sicily, landed at Tarentum, drove away the Byzantine garrison and governor, and from that time they made frequent incursions into Apulia. They also took Brundusium, Barium, and other towns, most of which however they abandoned after sacking them.

A.D. 839. Sicardus, prince of Beneventum, being murdered by his subjects, his treasurer Radelchis was elected in his place. But Siconulphus, brother of Sicardus, being supported by the counts of Compsa and Capua, and by the Neapolitans, was proclaimed prince at Salernum in 840. A long war ensued, in which both contending parties called in to their assistance bands of Saracens from Africa and Spain, who devastated a great part of the country. The inhabitants at last implored the interference of Louis II., king of Italy, and son of the emperor Lotharius, who came with an army and drove away the Saracens as far as Bari.

851. An arrangement was made through King Louis, by which the old Longobard principality of Beneventum was divided into two, Radelchis retaining the northern part, or the country of Samnium, which extended as far as the Adriatic, with the title of Prince of Beneventum, and Siconulphus assuming the title of Prince of Salernum, which principality embraced Campania and Lucania. Both princes acknowledged themselves vassals of Louis, king of Italy.

852. Landulf, count of Capua, declared himself independent of the prince of Salernum, and thus a third state was formed out of the former principality of Beneventum. In 856, Lando, son of Landulf, built the new city of Capua on the banks of the river Vulturnus, and transferred to it the inhabitants of old Capua, which had fallen to decay.

876. The people of Bari, supported by the Byzantines, drove away the Saracens, and their town became the residence of the Byzantine governor, or strategos, of those parts of Apulia, Calabria, and the country of the Bruttii which still remained under the dominion of the Eastern emperor. Naples and Amalfi had their own dukes, who were elected by the citizens, subject to the approval of the court of Constantinople.

890. Leo the Philosopher, emperor of the East, availing himself of disputes concerning the succession to the principality of Beneventum, took possession of that city, and put an end to the Longobard principality of Beneventum, which had lasted more than three centuries.

900. The people of Beneventum, supported by Guy, duke of Spoleto, having driven away the Byzantines, proclaimed Atenulfus, count of Capua, as their prince. Atenulfus however and his successors continued to reside at Capua, which city thus became the capital of an extensive principality which embraced Campania, Samnium, and part of Apulia and of the present Abruzzo.

963. Landulfus II., prince of Beneventum and count of Capua, died and was succeeded by his two sons, Landulfus III. as prince of Beneventum, and Pandulfus, called 'Iron Head,' as count of Capua; and soon after Otho I. of Germany, emperor of the West, went to Capua, where he received the homage of the two brothers, as well as of Gisulfus, prince of Salernum. On this occasion Otho raised Capua to the rank of a principality in favour of Pandulfus. In 969 Landulfus died, and Pandulfus took possession of Beneventum also; and lastly, in 978, Gisulfus, prince of Salernum, died without issue, having appointed for his successor Pandulfus, who thus re-united under his sway the whole of the former duchy of Beneventum. Pandulfus, the 'Iron Head,' appears to have been a remarkable prince, both as a soldier and a statesman, and he is extolled as such by the anonymous chronicler of Salernum, who was his contemporary. But after his death, A.D. 982, his dominions were divided between his two sons, one of whom had Salernum, and the other Beneventum.

982. Otho II. came with an army with the intention of expelling the Byzantines from Apulia, but having failed, he revenged himself upon the people of Beneventum, who had forsaken him, by sacking their town. In consequence of this defeat of Otho, the Byzantines recovered in some degree their former preponderance in South Italy, seized the whole of the great Apulian plain as far as the Apennines, and built a town, which still exists, and which they called Troia. They also appointed a new officer, with the name of Catapan, to rule over Apulia, and fixed upon Bari for his residence. [CAPITANATA.]

About the year 1016, a party of Norman pilgrims from the duchy of Normandy in France, where their countrymen under Rollo had settled about a century before, returning from Palestine, landed at Salerno for the purpose of visiting the sanctuaries of Monte Casino and Mount Gargano. Waïmar, the prince of Salermo, struck with the comely persons and gallant bearing of the strangers, received them with marked attention, and induced them to tarry a while in his capital. In the mean time it happened that a Saracen squadron anchored at Salerno, and threatened to plunder the country unless they were paid a large sum of money. The natives of Salerno, as well as those of the neighbouring principalities, exposed to frequent attacks of Greeks and Saracens, had become dejected and timid, and did not think of resistance. Whilst their prince was preparing to pay the money, the Saracens landed on the beach outside of the walls of Salerno, where they feasted and caroused in heedless security on the provisions which were supplied to them. The Norman knights, to the number of forty, some say more, indignant at the sight, suddenly sallying out of the town, fell upon the Saracens, who were either asleep or otherwise unprepared for defence, made great slaughter of them, and drove the remainder to their boats. The prince and citizens of Salerno loudly expressed their admiration and gratitude to the strangers, and offered them an honourable settlement in the country, which the pilgrims declined, but promised that on their return to Normandy they would send some of their countrymen. Soon after, one Osmond Drengot, accompanied by his brothers Rainulf, Aschittin, and other relatives, made their appearance at Capua, where they were well received by Pandulfus IV., prince of Capua and Benevento. It happened about this time (A.D. 1017) that an insurrection broke out at Bari among the natives against their Byzantine rulers. The insurgents, headed by a certain Melo, of Longobard descent, and Dato, his brother-in-law, proceeded in expelling the Greek Catapan and garrison. But new troops coming from the East, laid siege to Bari, and as the inhabitants appeared disposed to surrender, Melo and Dato contrived to escape to Capua, where they found the Norman emigrants, whom Melo engaged to join him, together with other militia from the neighbouring principalities of Salerno and Benevento. With these troops Melo entered the plains of Apulia, and defeated the Greeks, but was at last defeated himself near the site of Cannæ in the year 1019. The Normans however protected his retreat, and Melo returning to Capua, and having recommended his Norman friends to Pandulfus, prince of Capua, and Waimar, prince of Salerno, set off for Germany to induce the emperor Henry II. to interfere in the affairs of Southern Italy. Henry however was busy about other matters, and Melo, after repeated journeys, died in Germany. The Normans of Capua were located, some in the domains of the abbot of Monte Casino, and others under the command of Dato, at a fort on the banks of the Liris, which commanded the passage of that river. But Pandulfus, prince of Capua, and his brother Adinulfus, abbot of Monte Casino, were induced by large bribes from Basilius II., emperor of the East, not only to pay allegiance to him, but also to betray into his hands Dato, who, being seized by the Greeks, was taken to Bari, and there being tied in a sack, was thrown into the sea, as being guilty of high treason. The emperor Henry, hearing of these transactions, and being indignant at the encroachments of the Greeks, and the connivance of the Longobard princes, in breach of their sworn allegiance to the emperors of the West, assembled a force with which he crossed the Alps about the year 1022, and was joined by the contingents sent by the bishops of Milan, Verona, Vercelli, Piacenza, and other cities, most of which had in that age their respective bishops at the head of their municipal administration. The emperor sent 15,000 men under Poppo, patriarch of Aquileia, along the coast of the Adriatic, to attack the Greeks in Apulia; and another body of 20,000 men, under Pelegrinus, archbishop of Cologne, he sent by the way of Rome, with orders to seize the abbot of Monte Casino and the prince of Capua. Henry himself followed more leisurely with the remainder of his army. The Norman settlers, who had increased in number, being joined by many of their countrymen from Normandy, followed the imperial standard, the abbot Adinulfus fled to Otranto, and Pandulfus was taken by the emperor and sent as prisoner to Germany, and the principality of Capua was given to the count of Teano. On returning to the north, Henry recommended his German auxiliaries to the new prince of Capua; but after the emperor's departure, the Normans, being neglected by the native princes, took possession of a district of Campania on the borders of the duchy of Naples, and with the consent of that duke, where they built a town, A.D. 1020, which was called Adversa or Aversa, being considered as a bulwark of Naples 'adversus' Capua. [AVERSA.] Rainulfus assumed the title of count of Aversa, which title was confirmed some years after by the emperor Conrad. This was the first Norman state established in Italy.

Norman Period, from 1020 *to* 1194.—A fresh band of Normans, headed by William, Drogo, and Hunfred, sons of Tancred, count of Hauteville, near Coutances in Normandy, a powerful baron, came to seek their fortunes in Italy, and entered the service of Waïmar IV., prince of Salerno, whom they assisted in taking Sorrento, Amalfi, and other places.

1037. Maniaces, Catapan of Apulia, having prepared an expedition to recover Sicily from the Saracens, requested and obtained of the prince of Salerno the assistance of his Norman auxiliaries. The expedition proved successful, and put an end to the dominion of the Saracen emirs, who were lieutenants of the Zeiride sultan of Tunis and Kairwan, A.D. 1038. The Normans, and especially their leader William of Hauteville, surnamed Bras-de-Fer, or the 'iron-arm,' gave material assistance to the Byzantines in this campaign; but being ill requited by Maniaces, they left him, and crossing the Strait of Messina, they marched through Calabria, and seized Melfi, Venosa, Ascoli, and other towns of Apulia. They made Melfi their capital, and having formed an alliance with the Longobard prince of Benevento, they repulsed all the forces which the Byzantines sent against them, and took the whole of Apulia, with the exception of Bari, Tarentum, and a few other maritime towns which were garrisoned by the Greeks.

1043. The Normans having divided the conquered territories into so many fiefs among their leaders, appointed one of them, William Bras-de-Fer, to be above the rest as president in the council and captain-general in the field, with the title of count of Apulia, amidst the acclamations of the united militia, Norman, Longobard, and Apulian. The Norman county of Aversa remained separate and independent, but its count, Rainulfus, as well as Waimar, prince of Salerno, attended the diet of the Norman barons of Apulia at Melfi, in which William was proclaimed.

1046. William Bras-de-Fer died, and his brother Drogo was proclaimed count of Apulia.

1047. The emperor Henry III. repaired to Capua, and gave to Drogo the investiture of the county of Apulia; and being dissatisfied with Pandulfus, prince of Benevento, he made a grant of the principality to both the count of Apulia and the count of Aversa, who divided the territory between them, but did not take the town of Benevento.

1053. Pope Leo IX. having marched with an army against the Normans, was defeated and taken prisoner; as however he was treated by them with the greatest respect, he not only confirmed the count of Apulia, but gave the Normans all the lands that they might conquer in Calabria and Sicily as hereditary fiefs of the see of Rome. Robert of Hauteville, called Guiscard or Wiskard, 'the wise,' having succeeded his brother as count of Apulia, readily availed himself of this grant by taking a great part of Calabria from the Byzantines. His younger brother Roger had the greater share in this new conquest, which he completed by taking Rhegium and Scylacæum.

1059. Robert Wiscard was by common consent of the Norman chiefs proclaimed duke of Apulia and Calabria. He assumed the ducal coronet and furred robe, and was confirmed by pope Nicholas II., in a council held at Melfi, on his paying allegiance to the see of Rome. The pope moreover granted him the investiture of the island of Sicily, which he engaged to take from the Saracens, who had recovered it through the weakness and mismanagement of the Byzantine governors. The pope granted in like manner to Richard, Norman count of Aversa, the investiture of the principality of Capua, which he had taken from Landulfus, the last Longobard prince of Capua. Duke Robert created his brother Roger count of Calabria.

1061. Roger invaded Sicily, being supported by one of the Saracen chiefs, and surprised Messina.

1070. Robert Wiscard took Bari, the last stronghold of the Eastern emperors in Italy, after three years' siege. He then joined his brother in Sicily, where they took Palermo, and allowed the Mohammedan population the free exercise of their religion.

1075. Robert Wiscard took Salerno, and drove away Gisulfus, its Longobard prince.

1077. Landulfus, prince of Benevento, dying without issue, Robert annexed the principality to his other dominions, giving the town of Benevento, with a small territory around, to the pope. Thus ended the last Longobard principality in Southern Italy.

1081. Robert Wiscard, whose daughter had married the son of Michael Ducas, emperor of Constantinople, sailed with an armament to the liberation of Michael, who had been deposed by Nicephorus Botoniates. Having entrusted the administration to his second son Roger, he took with him his eldest son Bohemund. Corfu and Durazzo fell into his hands, and marching thence overland, he defeated the forces of Alexius Comnenus, who had taken possession of the Eastern throne. He soon after returned to Italy to the assistance of pope Gregory VII., who was besieged in Rome by the troops of the emperor Henry IV. He liberated the pope, who followed him to Salerno. [GREGORY VII.]

1085. Robert having reimbarked for the East, where his son Bohemund was carrying on the war against the emperor Alexius, fell ill and died in the island of Corfu, at the age of sixty. Robert Wiscard was the founder of the Sicilian monarchy, and a very distinguished personage in the middle ages. He bequeathed Sicily and part of Calabria to his brother Count Roger, with the exception of the city of Palermo, which he had chosen for his own capital; to his second son Roger he left the duchy of Apulia, with Salerno and the rest of his continental dominions; and to Bohemund he gave his Eastern conquests. Bohemund afterwards having joined the great crusade, became the founder of the kingdom of Antioch.

1090. Noto, the last Saracen garrison in Sicily, surrendered to Count Roger, who assumed the title of 'Great Count of Sicily.' He established feudality in those towns and districts which he had taken by force from the Saracens; the rest of the country was considered crown domains, the proprietors of which remained undisturbed, under the name of allodialists or burgensatici. He instituted the Sicilian parliament, or assembly of the great feudatories, both ecclesiastical and lay, who met when convoked by the prince. In 1091 he sailed to Malta, and obliged the Gaït, or Saracen governor, to pay tribute to the count of Sicily. Count Roger protected all his subjects, both Christians, Saracens, and Jews, and was popular with all. He even formed a body-guard of Mohammedans.

1101. Count Roger of Sicily died, much regretted, and was buried with great pomp at Mileto in Calabria. He was succeeded by his son Roger.

1111. Duke Roger of Apulia died at Salerno, and was succeeded by his son William, who, being harassed by his refractory vassals, applied to his cousin Count Roger II. of Sicily, entreating him to come to his assistance, in reward for which he gave him the city of Palermo, which Robert Wiscard had kept for himself.

1127. Duke William died at Salerno, having no issue, upon which Count Roger of Sicily came with an armament to claim the inheritance, and, after much opposition from some of the barons, succeeded in establishing his authority over all Apulia, Calabria, and Salerno. Pope Honorius II. however opposed his claim, and excommunicated him, and preached a crusade against him. The pope invaded Apulia with an army, but was obliged to retire.

1128. A conference took place near Beneventum, between Roger and the pope, in which the latter gave him the investiture of the dukedom of Apulia and Calabria. Roger was now master of the whole of the states which have since constituted the united Sicilian monarchy, with the exception of the principality of Capua, which was possessed by another Norman dynasty, and the duchy of Naples, which still retained its independence and its elective dukes under a nominal allegiance to the Eastern emperors.

1130. Roger having assembled a parliament at Salerno, to which he called not only his feudatories and prelates, but also the most learned men of his dominions, it was decided in that assembly that he should assume the title of king of Sicily. This resolution was unanimously confirmed by the Sicilian parliament which he soon after convoked at Palermo; and on Christmas-day of that year Roger was solemnly crowned in the cathedral of Palermo by the four archbishops of Palermo, Salerno, Capua, and Benevento. He assumed the title of 'Rex Siciliæ, Ducatus Apuliæ, Principatus Capuæ.' Robert, prince of Capua, carried the crown in the procession. Pope Innocent II. refused to acknowledge Roger's new dignity, and Roger on his part acknowledged Anacletus, Innocent's competitor, as pope.

1135. King Roger, being annoyed by the hostile conduct of the prince of Capua, seized that principality and annexed it to his other dominions.

1136. The emperor Lotharius II. and pope Innocent II. took Capua and great part of Apulia, and appointed Rainulf, count of Avellino, duke of Apulia. Roger withdrew to Sicily, but in the following year, Lotharius having returned to Germany, he landed at Salerno and retook Capua, Nocera, and other towns. The war between him and Rainulf lasted two years.

1138. Rainulf died of a fever in Apulia, and Roger soon after subdued that province.

1139. Pope Innocent marched with troops into Campania, but was surprised and taken prisoner by Roger, who treated him with great respect, and on the 25th of July a treaty was concluded between them, by which the pope granted to Roger the investiture of the kingdom of Sicily, the king swearing allegiance to the see of Rome, and promising the payment of an annual tribute. About the same time Sergius, duke of Naples, having died, the Neapolitans chose for their duke the eldest son of king Roger, but retained their municipal laws and liberties.

1140. King Roger crossed the river Pescara and seized that part of Abruzzo which lies between the Pescara and the Tronto, and thus the Sicilian kingdom attained its compact form and the boundaries which it has retained to this day. Roger assembled a parliament at Ariano, in which a new silver coin was ordered to be struck, called a 'ducat.' In 1146 he sent an armament to Tripoli in Barbary, which he took, as well as the towns of Mahadia and Sus, the island of Jerbi, and other places. Being offended at the emperor Manuel Comnenus for some slight, king Roger sent his admiral, George of Antioch, who seized Corfu, invaded Acarnania, and took Thebes and Corinth, which he plundered. He returned to Sicily with a large booty and many spinners and weavers of silk, whom Roger settled in his palace at Palermo. Thus the manufacture of silk was introduced into Sicily.

1151. Roger named his son William his colleague on the throne.

1154. Roger died at the age of fifty-nine, leaving his third wife pregnant. She was delivered of a daughter, Constance, who was afterwards wife of the emperor Henry VI. and mother of Frederic II. King Roger was the third great man of his family. Robert Wiscard and Count Roger laid the foundations of the monarchy by their conquests, and King Roger consolidated the whole into a regular form, made a body of laws, and established an orderly system of administration.

1154. William I., called 'the bad,' succeeded, but did not imitate his father. He began well by defeating by land and by sea the armaments of Manuel Comnenus, as well as the troops of the sultan of Egypt. He also extricated himself with honour out of some disputes which he had with the pope. But afterwards trusting implicitly to his favourite minister and admiral Majone, a covetous and cruel man, he involved the kingdom in a civil war.

1160. Majone was killed by a band of conspirators, but the rebellion continued until it was put down by force. In 1162 peace was established in the kingdom.

1166. William I. died at Palermo, and was succeeded by his son William II., a minor, under the guardianship of his mother. The first years of his reign were distracted by revolts of the barons, and by popular tumults in Palermo, where the Saracens, or Moslems, who formed a considerable and wealthy part of the population, being accused of heinous crimes, were treated with great rigour.

1174. William raised the splendid cathedral of Monreale near Palermo.

1177. William married Joan, daughter of Henry II., king of England, who was received at Palermo with great pomp.

1178. A Sicilian fleet sailed to the coast of Syria, and retook Tyre and Antioch from the arms of Salaheddin.

1184-85. A Sicilian armament was sent to Thessalonica to support the claims of Alexius Comnenus against the usurper Andronicus. The war ended with the dethronement and execution of Andronicus by the people of Constantinople. About 10,000 Sicilian soldiers perished in battle.

1185. William having no issue, the princess Constance, his aunt, was married to Henry, son of the emperor Frederic I., and declared heiress apparent of the kingdom.

1188. Another Sicilian fleet, under William's great admiral Margaritone of Brindisi, sailed to Syria, and relieved Tyre and Antioch, which were besieged by Salaheddin.

1189. William II. died at Palermo. He was styled 'the good,' a surname which he deserved for his integrity, his love of justice, and his care for the welfare of his subjects. The Sicilian parliament, being convoked by the chancellor of the kingdom, proclaimed his cousin Tancred, count of Lecce, an illegitimate son of Roger, the eldest son of king Roger. This was done through fear of Henry VI. and his German followers, who would have taken possession of the kingdom through the claim of Constance, Henry's consort. Tancred had a great reputation for courage, generosity, and love of learning.

1190-91. Richard I. of England landed in Sicily, and had several interviews with Tancred with respect to his sister the dowager queen of Sicily and her widow's settlement.

1191. Henry VI., now emperor of Germany, invaded Apulia, and took Salerno. Returning to Germany, he left behind his wife Constance, who was made prisoner by the people of Salerno, and given up to Tancred, who generously restored her to her husband. Tancred drove away the German troops from Apulia.

1194. Tancred died at Palermo, leaving a son William, a minor, to succeed him under the guardianship of his mother, queen Sybilla. Henry VI. having again entered Apulia with a large force, and being supported by the turbulent barons, overran the country as far as Rhegium, crossed the strait, and took Messina, Syracuse, and Catania. He then marched to Palermo, and queen Sybilla and her son William having retired to a castle, the city opened its gates to Henry, who was acknowledged king and solemnly crowned.

1195. Henry having seized the persons of queen Sybilla and her son William, confined them first to a monastery, and had the child barbarously mutilated and deprived of sight. The boy expired in prison shortly after. He also put to a cruel death their principal adherents. Thus ended the Norman dynasty, which had reigned with glory over Sicily for more than a century.

Suabian Dynasty. 1194-1260.—A revolt, caused by the cruelties of Henry VI. and the brutality of his German followers, broke out in Sicily. It was quelled by massacre, and the prisoners were put to a cruel death, some being empaled, some burnt alive, and others flayed alive. The town of Castrogiovanni however persisting in the revolt, Henry went to besiege it, when he was taken ill and died, A.D. 1197. Constance remained regent for her son young Frederic II. She restored peace, sent away the Germans, and put herself entirely into the hands of her subjects, who loved her as being the daughter of King Roger.

1198. Frederic II., then four years old, was crowned king at Palermo. Not long after Queen Constance died, leaving her son at Palermo, where he was educated under the political tutorship of the pope.

The events of the life of Frederic are related under Frederic II. of Germany. Under his reign Sicily and Apulia enjoyed comparative tranquillity and considerable prosperity. Frederic was a legislator: many of his 'Constitutions,' or code of laws for his Sicilian kingdom, are deserving of praise, considering the time when they were enacted. He was the founder of the third estate, or commons, in the island of Sicily, having called to sit in the Sicilian parliament two 'prudhommes,' or 'wise men,' for every demesne town. He also established a municipal body in every commune. Although emperor himself, he caused the German diet to recognise the kingdom of Sicily as independent of the empire. He took away from the barons the exercise of criminal jurisdiction, which in their hands was a formidable means of oppression, and gave it to the king's judges. He abolished the trials called the 'judgments of God,' and judiciary duels. He encouraged public instruction, founded a university at Naples, and schools at Palermo and in other towns.

1250. Death of Frederic II., a great prince, and a benefactor to Sicily. Conrad succeeded him, but died in 1254, leaving his only son Conradin two years of age. Manfred, a natural son of Frederic, assumed the regency of the kingdom of Sicily.

1258. Manfred was crowned king at Palermo with the assent of the parliament on the rumour of the death of Conradin. The events of his reign are given under Manfred.

1266. Battle of Benevento, between Charles of Anjou, whom the pope had crowned king of Sicily, and Manfred. Manfred was defeated and killed, and Charles was acknowledged king of Sicily, Apulia, Calabria, &c. His government was tyrannical and rapacious, and his French soldiers were insolent and dissolute. [Anjou, Dukes and Counts]

1267. Expedition of the young Conradin to recover his paternal kingdom. He was defeated by Charles of Anjou at Tagliacozzo, and betrayed into his hands.

1268. Public execution of Conradin at Naples. [Conradin.]

Anjou and Aragonese period.—1282. Sicilian vespers, or general massacre of the French in the island of Sicily, to the number of about 4000. The Sicilians called to the throne Pedro, king of Aragon, who had married Constance, daughter of Manfred. Charles of Anjou retained the continental territories, and fixed his residence at Naples. Both styled themselves king of Sicily, and the usage began gradually to prevail at Naples of calling the island Sicily 'ultra pharum,' and the continental territories 'Sicily citra pharum.'

1285. Pedro died, and was succeeded in Sicily by his second son, James; the eldest, Alonso, having succeeded to the crown of Aragon.

1291. Alonso having died, James succeeded to the crown of Aragon, and at the suggestion of Pope Boniface VIII., a friend of the Anjous, he ceded Sicily to Charles II. of Naples, the pope granting him in exchange the investiture of Sardinia. [Sardegna, *History of.*] The Sicilians however refused to be given up to the Anjous, and in 1296 the parliament proclaimed Frederic, younger brother of James, king of Sicily.

1296-1337. The reign of Frederic was stormy; he had to struggle against his own brother, who joined his Aragonese troops to those of the Anjous from Naples and from France, and against Pope Boniface VIII., who supported both by the terrors of church excommunication. The foreigners landed repeatedly in Sicily, but were ultimately defeated.

1302. Peace of Castronovo, which put an end to a war of twenty years. Frederic was acknowledged by the Anjous on condition of marrying Eleanor, Charles's daughter, and on the further condition that after his death Sicily should revert to Charles and his successors.

1309. Death of Charles II. at Naples. He was succeeded by his son Robert, who put himself at the head of the Guelphs of Italy, while Frederic of Sicily took the part of the emperor. A desultory war was renewed between Sicily and Naples.

1331. Frederic, in a parliament assembled at Syracuse, named his son Peter his colleague and successor, and had him crowned at Palermo.

1337. Frederic II. of Sicily died after an eventful but a successful reign of forty years. His son Peter II. succeeded him.

1342. Peter of Sicily died, leaving his son and heir Louis a minor, under the guardianship of John, duke of Randazzo, an able statesman. Hostilities continued between Sicily and the Anjous.

1343. Death of Robert of Naples His love of letters has consecrated his memory; he was the friend of Petrarch and Boccaccio.

1343-82. Joan I. succeeded her father Robert. For the events of her reign see Joan I. of Naples.

1348. Treaty of peace by which Louis of Sicily and his successors are acknowledged by the Anjous of Naples as legitimate kings of Sicily.

1355. Louis of Sicily died, and was succeeded by his brother Frederic III. Sicily, under the weak reign of Frederic, was a prey to factions. The barons encroached on the domains of the crown, as well as on the liberties of the towns.

1377. Frederic dying without male issue, the crown devolved upon Martin, called the younger, son of Martin Infante of Aragon, and who had married Mary, daughter of Frederic. He was opposed by the refractory barons, who kept Sicily in a state of anarchy.

1382. Joan of Naples put to death by Charles of Durazzo, who succeeded her.

1386. Charles, being murdered in Hungary, was succeeded by his son Ladislaus.

1398. Martin of Sicily, being supported by his father, Martin the elder, who had become king of Aragon in 1395, was crowned at Palermo. He restored the authority of the crown, and checked the turbulent barons.

1409. Martin of Sicily died in an expedition to Sardinia, and was succeeded on the throne of Sicily by his father, Martin the elder, king of Aragon, who died next year.

1412. Ferdinand I. of Aragon, nephew of King Martin, was proclaimed king of Sicily after an interregnum of two years. He sent the Infante Don Juan to govern the island.

1414. Ladislaus, king of Naples, died after a stormy reign. He was mostly employed in foreign wars, and was careless of the welfare of his subjects. He was succeeded by his sister Joan II. of Naples.

1416. Alfonso, son of Ferdinand, having succeeded his father as king of Aragon and Sicily, recalled the Infante Don Juan and appointed a viceroy to govern Sicily. This was the beginning of the Spanish viceregal government of Sicily, which lasted three centuries, to the great disappointment and disadvantage of the Sicilians.

1435. Joan II. of Naples died, and bequeathed her crown to Réné. [Rene of Anjou.]

1442. Alfonso V. of Aragon and I. of Sicily took Naples and drove away Réné. Thus Sicily and Naples were temporarily reunited. [Alfonso V.]

1458. Alfonso died after a long and eventful reign. He had some brilliant qualities, but was too fond of war, and was too subservient to the feudal interest. His illegitimate son Ferdinand succeeded him at Naples. The events of his reign are related under Ferdinand I. of Naples. Alfonso's brother Don Juan succeeded to the crowns of both Aragon and Sicily, and Sicily was again governed by viceroys from Spain.

1479. Ferdinand of Aragon and Castile, called the Catholic, son of Don Juan, succeeded his father both in Aragon and Sicily. He was styled Ferdinand II. of Sicily. [Ferdinand V. of Castile.]

1494. Alfonso, son of Ferdinand of Naples, succeeded to that crown after his father's death. The French, under Charles VIII., who had inherited the claims of the Anjous, invaded that kingdom. Alfonso escaped to Sicily, where he turned monk, after abdicating in favour of his son Ferdinand. Sicily remained quiet under the government of Ferdinand of Spain.

1496. Ferdinand, styled II. of Naples, recovered his kingdom, which the French were obliged to evacuate by a general league of the Italian powers against them. He died soon after, and was succeeded by his uncle Frederic, who, being threatened by Louis XII. of France, applied to his relative Ferdinand of Aragon and Castile, who ordered Gonsalo of Cordova, his captain-general in Sicily, to proceed to the mainland, with a secret understanding between Ferdinand and Louis XII. that they were to divide the kingdom of Naples between them. Pope Alexander VI. (Borgia) became a fit party to this disgraceful transaction, by granting a bull of investiture to the two crowned plunderers. Louis invaded the kingdom from the north and Gonsalo advanced from the south, both putting garrisons in the towns which they occupied. Frederic, finding himself betrayed by his own relatives, left Naples and asked the French king for an asylum in his dominions.

1501. Louis XII. granted to Frederic the duchy of Anjou with a pension. Frederic died in France in 1504. His eldest son Ferdinand died in Spain childless, and his other sons died young and without issue. Thus ended the Aragonese dynasty of Naples.

1503. The French and Spaniards quarrelled about the partition of the kingdom of Naples, and Gonsalo settled the dispute by defeating the French at Cerignola in Apulia and driving them out of the country. The whole of the Sicilian kingdom acknowledged Ferdinand of Spain, who governed both countries by viceroys.

1516. Ferdinand died, and was succeeded by Charles V. of Germany, styled I. of Spain, II. of Sicily, and IV. of Naples. [CHARLES V. OF GERMANY.]

Spanish Viceregal period for both Naples and Sicily. 1503 to 1734.—During this long period those fine countries retrograded in many respects. The national spirit became extinct, and the ruling country, Spain, being itself in a state of decay, could not infuse any new vigour into its dependencies. The administrative, economical, and judicial systems, imperfect as they were under the former rulers of Naples and Sicily, became worse under the administration of the Spanish viceroys. Several of those viceroys were men of good intentions and of strict integrity, but their tenure of office being short and depending upon the intrigues of the distant court of Madrid, they had not the means or the time to effect any enlarged plan of improvement. The names of some of them however are recorded with honour in the annals of the kingdom. They embellished the chief towns, but the country was neglected. It was overrun by outlaws, its resources were wasted, and the population decreased. In Sicily the parliament maintained some sort of national spirit, but in the Continental territory the parliaments had never been convoked so regularly as in Sicily, and at last fell totally into disuse. The last parliament sat at Naples in September, 1642. On the other side the tribunal of the Inquisition was established in Sicily, but was firmly rejected by the Neapolitans. Alarming insurrections broke out both in Naples and in Sicily; that of 1647 is related under ANIELLO TOMMASO. In 1671 Messina revolted against the Spaniards, and admitted a French garrison, France being then at war with Spain. A few years after, peace being made between the two powers, the French abandoned Messina, ten thousand of whose inhabitants emigrated to avoid the vengeance of Spain. At last the war of the Spanish succession broke the power of Spain in Southern Italy.

1708. The Austrian troops under Marshal Daun conquered Naples on behalf of the Archduke Charles, who claimed the crown of Spain. Sicily remained quietly under Philip V. of Spain. By the peace of Utrecht, Charles, now emperor, resigned his claims to Spain, but retained Naples, Sardinia, and Milan, and by the express intervention of Queen Anne of England, Sicily was given to Victor Amadeus of Savoy, with the title of king.

1714. Victor Amadeus made his solemn ingress into Palermo, and having assembled the Sicilian parliament, he manifested enlightened views of administration. The census of the island of Sicily being taken on that occasion, gave a return of 1,153,000 inhabitants, of which Palermo reckoned 120,000.

1718. The expedition sent by Cardinal Alberoni in time of profound peace took Sicily from King Victor, but England and Austria obliged the Spaniards to evacuate the island, and by a new arrangement Sardinia was given to King Victor and Sicily to the emperor Charles. Thus Sicily and Naples were again united under a foreign crown. [ALBERONI; SARDEGNA.]

1734. A new war having broken out in Europe on the occasion of the disputed succession of Poland, Spain undertook to reconquer both Naples and Sicily. The Infante Don Carlos, son of Philip V., marched with a well appointed army and took Naples from the Austrians. He then proceeded to Sicily, which he also conquered after some resistance. At the same time Philip V. made a solemn renunciation of Naples and Sicily in favour of his son Don Carlos, who assumed the title of King of the Two Sicilies, and his heirs.

1735. *Restoration of the Sicilian Monarchy.*—This was the beginning of a new æra for the countries of Naples and Sicily. They resumed their rank as an independent monarchy, and also their nationality, which is an essential condition to the well being of a people. Don Carlos proved a good sovereign: he completely identified himself with his new subjects, and he set his mind on restoring the monarchy to that unity of administration and that political rank and independence which it had assumed under its first king Roger. Charles gave himself the example of respecting the laws; he chose able ministers, among others Tanucci, to assist him; he checked the power of the barons, and took the first steps towards the extinction of feudality, which was afterwards effected under his successor. He created a national army and navy, encouraged useful studies, established workhouses for the destitute, built a new molo and quays at Naples, the splendid theatre of S. Carlo, the museum, and the magnificent residence of Caserta, on which last he spent large sums which might have been more usefully employed. But the finances were in a flourishing condition, and the country enjoyed peace, and a degree of prosperity to which it had been a stranger for centuries.

1759. Charles, having by the death of his brother Ferdinand VI. of Spain succeeded to the crown of that monarchy, resigned his kingdom of the Two Sicilies to his son Ferdinand, then eight years old, appointing a council of regency during his minority. The first part of the reign of Ferdinand, till the epoch of the French revolution, was spent in forwarding the system begun by Charles. A sketch of the long reign of Ferdinand is given under FERDINAND IV. of Naples.

1799. A French army invaded the kingdom of Naples in January, after a desperate resistance on the part of the populace, and established a republic. Ferdinand had escaped to Sicily. In the following May the French troops retired from Naples, being recalled to the north to fight the Austrians and Russians; and in June the troops of Ferdinand, joined to a large Calabrian militia, led by cardinal Ruffo, retook the capital and the whole kingdom. A fearful reaction and proscription took place.

1806. A French army sent by Napoleon invaded the kingdom, and entered Naples without opposition. Ferdinand took refuge in Sicily. A partisan war was carried on for several years in Calabria between the French and the natives. Joseph Bonaparte was proclaimed king of Naples. In the same year feudality was abolished by a royal decree.

1809. Joachim Murat was appointed by a decree of Napoleon to the throne of Naples, in lieu of Joseph, appointed by another decree to the throne of Spain. [MURAT, JOACHIM.]

1812. A new representative constitution upon a liberal scale was proclaimed in Sicily, and feudality abolished by the vote of the Sicilian barons in parliament assembled.

1815. The last parliament of Sicily convoked by king Ferdinand. Murat makes war against Austria, is defeated, and the Austrians enter Naples and restore king Ferdinand.

1816. Ferdinand assumes the title of Ferdinand I., King of the United Kingdom of the Two Sicilies, and the legislation and administration of both divisions of the kingdom were reduced to a uniform system. Thus the Sicilian constitution was virtually abolished. The French civil code was retained with some modifications.

1818. A new concordat for the Two Sicilies agreed upon by the pope.

1820. Military revolution at Naples; the Spanish constitution of 1812 is proclaimed; and a united parliament for Naples and Sicily is convoked. Palermo however and other towns of Sicily proclaim the independence of that island under the same king; in short, a repeal of the union which had been enforced by Ferdinand. The parliament of Naples sends troops to Sicily, and Palermo is retaken.

1821. An Austrian army marches upon Naples with little opposition. The constitution is abolished, and Ferdinand is restored to absolute power.

1825. Ferdinand dies and is succeeded by his son Francis.

1830. Francis dies after a short and comparatively unimportant reign, and is succeeded by his son Ferdinand II., the present king.

The authorities for the history of the Two Sicilies are very numerous: the old chroniclers, for the Norman, Suabian, and Anjou periods; and Panormita, Pontanus, Valla, Collenuccio, and Albino, for the Aragonese dynasty. The general history of the kingdom has been written by Costanzo, Summonte, and above all by Giannone, whose history is a classical work, and has been worthily continued down to the present times by General Colletta.

SICILY (in Latin, *Sicilia;* in Greek, *Sicelia*, Σικελία), a large island in the Mediterranean Sea, which is separated by a narrow channel, called Faro di Messina, from the coast of Calabria. It is in the shape of a triangle, the apex of which, formed by Cape Lilybæum, is towards the west, and is about ninety miles distant from Cape Bon on the coast of Tunis. The north-east point, Cape Pelorus, now Capo di Faro, faces the rock of Scylla on the Calabrian coast, from which it is three miles distant, and the south-east point, Cape Pachynus, or Passaro, is sixty miles from the island of Malta. The length of the northern and southern sides of the island on the map, not including the windings of the coast, is about 175 miles each; and that of the eastern side is about 115 miles. A succession of mountain-groups extend across the island from east to west, bearing various names: the Mounts Pelorias, or Dinamari, between Melazzo and Taormina, which seem to be a continuation of the Apennines of Calabria; the Heræi Montes, farther west; the Nebrodes, now Monti Madonia, south of Cefalù and Termini, the highest summit of which, near the town of Polizzi, is said to be 6000 feet high; the Cratas, the ramifications of which extend to Palermo, and one of the highest summits of which is that of Calatamauro, near Corleone; and, lastly, Mount S. Giuliano, or of Trapani, the antient Eryx. These mountains are much nearer to the northern than to the southern coast, and the longest watercourses are consequently on the south side of them. Toward the centre of the island are the limestone mountains of Enna, now Castrogiovanni, about 3000 feet high, and Mount Artisino, which is still higher; both of these are offsets of the Nebrodes ridges: and farther south the lower groups of the mountains of Noto, formed of tertiary rocks, extending to Cape Passaro; and the hills of Modica, the Hybla Minor of the antients. Few summits in Sicily, with the exception of Ætna, exceed 4000 feet in height. Towards the eastern coast rises the detached group of Ætna, which occupies an area nearly ninety miles in circumference, the highest summit of which is 10,874 feet above the sea. [Ætna.] At the southern base of Ætna lies the plain of Catania, the largest in the island. There are smaller plains along the southern coast, near Alicata, Terranova, Marsala, and at Melazzo on the northern coast; but the larger part of the surface of the island consists of mountains and valleys. The northern coast is generally high, the mountains in many places coming close to the sea. Few of the rivers are perennial. Of these few the principal are, the Giaretta, or Simæthus, which flows eastward through the plain of Catania; the Fiume Salso, the antient Himera, which flows southward, and enters the sea near Alicata; and the Belice, or Hypsa, which flows into the sea near Selinunte, the site of the ruins of Selinus. Most of the rest are torrents, with a short and rapid course—dry or nearly so in summer, but swelling into formidable floods in the rainy season, when, for the want of bridges, they become impassable for days together. These are called 'fiumare' in the language of the country.

Most of the mountains have been in the course of ages stripped of their antient forests, and they now present a naked and barren appearance. The sides of Ætna however are still covered with fine forests of oaks, beach, maple, birch, fir, and magnificent chesnut-trees. A few other forests are scattered over the surface of the island, the principal being that of Caronia, near the northern coast; that of Capellaro, south of Palermo; the woods near Castelvetrano, on the southern coast; and the forest of Giummia, west of Caltagirone. The mineral productions of Sicily consist of copper and silver, which were once worked, but are now abandoned; cinnabar, sulphur, which is found in great abundance, especially near San Cataldo, Galati, Butera, Bifara, Tavara, and Montegrande, and forms a considerable article of export from Alicata, Girgenti, and Palma. The quantity exported amounts annually to between 500,000 and 600,000 cwt., of which the greater part goes to England and France, at the average price of about one 'oncia' (or 10*s.* 6*d.*) the cwt. at the place of embarkation. Several of the sulphur-mines are let by the proprietors to English and other foreign houses, under an agreement with the government for a moderate fixed duty to be paid on the exportation. The infringement of the convention on the part of the Neapolitan government has given rise to the so-called 'Sulphur Question' between Great Britain and Naples, which attracted the attention of parliament in the session of 1840.

Sicily seems to contain no iron. Marble, alabaster, and other kinds of fine stones are found in abundance. Amber is found near Catania. There is rock-salt near Castrogiovanni, but the greater part of the salt consumed or exported is sea-salt, which is made in extensive salines or salterns along the coast, especially near Trapani, Marsala, and Agosta. The exported salt is mostly put on board Baltic or Norway traders.

Sicily has no lakes except that of Biviere, near the east coast, between Catania and Syracuse, which is about twelve miles in circumference, and abounds with fish; and the lake of Pergusa, near Castrogiovanni, in the centre of the island, which is about four miles round.

The sea around the coast of Sicily abounds with fish of various sorts, but the most productive fisheries are those of the migrating fish, the sardine and tunny. The tunny is caught in the months of May and June in the tonnare of Trapani, Termini, Cefalù, Melazzo, Capo Passaro, &c. The quantity is about 20,000 cwt., most of which is consumed in Sicily and Naples and other parts of Italy.

The cultivation of corn is said to occupy about one-half of the tilled land. They reckon five qualities of wheat, the best of which is that of Termini, and the lowest quality that of Catania. The difference of price between these two is about one-eighth. But corn is generally dear in the sea-port towns, owing to the want of roads in the interior; and it is no uncommon thing to see the corn of Apulia, and even of Egypt and the Crimea, brought by sea to Messina and other ports, and there sold cheaper than Sicilian corn. This tends to discourage native agriculture. The lower classes, especially in the interior, eat barley bread. Indian-corn and beans are cultivated to a small extent. Wine is made in abundance, especially in the southern part of the island. The white wines of Marsala, Castelvetrano, Catania, and Bronte or Ætna wine, are exported in considerable quantities. The firm of Woodhouse alone exports 5000 barrels yearly. Their establishment at Marsala, which has existed since Nelson's time, is on a large scale, with distilleries of brandy. The amarena of Agosta and the muscat of Syracuse are fine dessert wines. The red wine of Faro is a good common wine; that of Melazzo is somewhat inferior, and that of Mascali is still poorer. Sicilian wine, especially white, is exported to England, Germany, Spanish America, and Brazil. More than 20,000 barrels of both white and red are sent annually to Holland and the Baltic ports, where it is mixed with the French wines. Sicily sends also wine, both white and red, to Malta, the Levant, and the Black Sea. Much remains to be done for the improvement of Sicilian wines, both in the cultivation of the vine and in the process of wine-making. The distillery of alcohol has been greatly improved of late years by means of the new French alembics of Berard and Cellier, and a considerable quantity of spirit is exported to South America, as well as tartar, both white and red. Dried raisins, called zibib, are exported from Messina to the amount of about 6000 barrels. Messina is also the depot for the currants of the Lipari Islands, of which about 12,000 barrels are yearly sold and exported to Trieste, England, and America.

Olive-oil is not produced in great quantity, and is generally of an inferior quality, owing to bad management; it is produced chiefly along the northern coast, and not much of it is exported. The oil of Tusa and Cefalù is considered the best. Olive-plantations might easily be spread all over Sicily. Linseed-oil is made at Catania, and along the southern coast, and exported to Venice and Trieste. But the French oils extracted from poppy and colza have in great measure superseded the linseed-oil. Lemons and oranges are plentiful and fine, and are exported in considerable quantities; but for want of roads, much of the fruit is left to rot on the ground. Lemon-juice, or citric acid, and essences of lemon, citron, orange, aniseed, lavender, rosemary, and bergamot, constitute another branch of industry, which might be greatly extended. Silk was once a staple article of Sicilian export, especially to England; but it has been since driven out of the market by the silk of Bengal. The Sicilian silk is now sold, though in a less quantity, to French and Swiss manufacturers. The silk of Foria is the best; and next to it is the silk of Piana, Rametta, and S. Martine. Messina is the great mart for silk. The annual exportation is said to be 900 bales of 300 lbs. each.

Liquorice-juice is made chiefly at Catania, Patti, and Palermo, and exported to the amount of 5000 chests to England and the north of Europe, where it is employed in brewing. The pods of the caroob-tree, which grows wild in the southern part of the island, are exported to Trieste, Naples, Leghorn, and Genoa: they are chiefly used as forage for horses. Manna, which is an exudation of the sweet sap of the ornus, a species of ash which grows in the mountains of Sicily, is procured by making vertical incisions in the bark of the tree. The best manna is that of Gerace, which is produced in the country between Termini and Mistretta, and that of Capace. About 2500 cwts. are yearly exported. Almonds are exported to the quantity of about 12,000 cwts., chiefly to Germany and the north of Europe. The best almonds are those of Avola, near Syracuse, Mascali, and Palma; those of Girgenti and Terranova are inferior. Of pistachio nuts about 3000 cwts. are exported. Sumach, a dyeing substance extracted from the sprigs and dried leaves of a shrub, the *rhus coriaria*, is exported chiefly to England. The best sumach is that of Alcamo and Trapani. Kid-skins and lamb-skins, both dressed and undressed, are shipped from Messina to Germany and England. The other articles of Sicilian produce are—rice, nuts, walnuts, dried figs; cantharides, which immigrate from Africa; honey, wax, gum, soda, but the trade in soda is now greatly declined; and cotton, which is cultivated to a considerable extent near Catania, Biancavilla, Patti, Pachino, Terranova, &c. The sugar-cane, *cannamele*, which was once extensively cultivated in Sicily, is now entirely abandoned. The above list of valuable products shows not so much the actual wealth of Sicily as its natural capabilities.

Cattle are few in number, and mostly poor, owing to the want of the artificial grasses, and to their being neglected and left in the fields without stabling. The best horned cattle are those of the district of Modica. Sheep are numerous, but little attention has been paid to improving the breed, and the wool is bad. Cheese is made from ewes' milk. Goats are in many places preferred to sheep. The government has established a stud of foreign stallions to improve the breed of horses. Wolves are common in the mountains and forests, and snakes in the low plains.

The population of Sicily, which by the census of 1798 was 1,660,000, had risen in 1831 to 1,943,000; and in 1836 it exceeded 2,000,000. (Serristori, 'Statistica d'Italia.') This population is distributed very unequally over the surface of the island. The coasts, especially the northern and eastern, are thickly studded with towns, whilst the interior of the country is comparatively uninhabited. The tract between Messina and Catania is the most populous part of the island, whilst in the west the tract between Alcamo and Trapani is almost a desert. The mountains are generally uninhabited. The want of roads, and the greater resources for industry afforded by the proximity of the sea, serve to explain this inequality.

Sicily was formerly divided into three great divisions, called Valli: namely, Val di Mazzara, in the west; Val di Demona, in the east; and Val di Note, in the south. It is now divided for administrative purposes into seven provinces: Palermo, with 78 communes; Messina, 97 communes; Catania, 65 communes; Girgenti, 45 communes; Siracusa, 36 communes; Castanisetta, 29 communes; and Trapani, 20 communes. Every province is administered by an Intendente, and every commune has a Sindaco. For judicial purposes the provinces are divided into Judicatures, each having a judge of first instance for criminal and police matters. In the head town of each province is a collegiate court for civil suits. There is a 'Gran Corte Civile,' or court of appeal, in each of the three principal cities, Palermo, Messina, and Catania, and a supreme court of justice at Palermo. Commercial tribunals exist at Palermo, Messina, and Trapani. For scientific instruction there are three universities, Palermo, Messina, and Catania; and 21 colleges in the various provincial towns. There is an institute for female education at Palermo, under the name of 'Educandato Carelino;' naval schools at Palermo, Termini, Cefalù, and Messina; a veterinary school at Palermo, and an academy of the fine arts in the same city.

Elementary instruction is much neglected; some elementary schools exist in the towns, but few or none in the rural communes. The proportion of illiterate persons is very great; it forms in fact the great majority of the people.

The ecclesiastical establishment consists of three archbishops—Palermo, Monreale, and Messina; eleven bishops—Siracusa, Mazzara, Cefalù, Patti, Nicosia, Piazza, Gerace, Girgenti, Caltagirone, Catania, and Lipari; thirteen abbotships of royal presentation; and about 30,000 secular priests. The regular or monastic clergy consists of 7591 individuals, including lay brothers, distributed among 658 convents, of which 409 are possessed of property, and 249 are of the mendicant orders. The number of the convents of nuns is not ascertained. Sicily having remained undisturbed by revolution or French invasion, the property of the convents has remained untouched. (Serristori, *Statistica.*) No other form of worship is allowed in Sicily than that of the Roman Catholic Church. There is no permanent Jewish population. There are however colonies of Greek or Epirote origin, which migrated thither at the epoch of the Turkish invasion of Greece: they have retained the Eastern ritual, and have their own papas, but acknowledge the pope as their spiritual head, being of what is called the Greco-Latin Church. They are distributed in five or six localities: Piana de' Greci, near Palermo, containing about 5900 individuals; Palazzo Adriano, 5450; Mezzojuso, 4623; Contessa, 3000; Santa Cristina, 720; and lastly, the city of Messina, where the protopapa, or head of the Greek clergy, resides, subject however to the jurisdiction of the archbishop of Messina.

At the head of the political administration of Sicily is a lieutenant-general, who represents the king's person, and is often a member of the royal family. His salary is 36,000 ducats, or about 6000*l.* sterling. He has under him a secretary of state; but all important matters are referred to a section of the council of state sitting at Naples, which section is especially concerned with the affairs of Sicily. The finances and treasury of Sicily are kept distinct from those of the continental dominions. The revenue of Sicily amounts to 1,900,000 'onze,' of three Neapolitan ducats each, of which about 670,000 onze are employed for the expenses of the administration of the island, and the remainder is remitted to Naples for the general expenditure of the united kingdom. The communes are also taxed for their own local expenditure, to the aggregate amount of 700,000 onze.

Sicily, not having been visited by the storm of the French revolution, has not been burthened with the oppressive system of the conscription. Recruits for the army are obtained by voluntary enlistment. Sicily furnishes to the army of the united kingdom 10,000 infantry and 2000 cavalry. The permanent force kept in the island consists in ordinary times of 6000 men. The principal garrisons are those of Palermo, Messina, Syracuse, Trapani, Agosta, and Melazzo. There is a rural police, called 'armigeri,' charged with the care of keeping the roads clear from outlaws; but of late years it has been in great measure superseded by a body of gendarmes sent from Naples, who, not being acquainted with the localities and the people, have not proved so effective, and the consequence is that the country has again become insecure. The present king, Ferdinand II., during his residence in the island in the latter part of 1838, issued strict orders for the extirpation of the 'masnadieri,' or banditti: he also ordered several carriage-roads to be opened throughout the island, and allotted one million of ducats for the purpose. Several new roads are now in progress. The king also ordered a catasto, or re-valuation of landed property, to be made: he took off several taxes which weighed heavily upon agriculture, and ordered the final abolition of every remnant of feudality. He set the example himself by renouncing several feudal duties and fees. He also ordered the demesne lands to be distributed among the poor rural population.

The manufactories of Sicily are neither numerous nor on a large scale. Cotton-cloth is manufactured at Messina, Catania, Palermo, and Caltagirone; silks at Palermo, Catania, and Nicolosi; leather at Messina; gloves, soap, artificial flowers, and paper, at Palermo; coral from the coast of Africa is wrought at Trapani.

The merchant vessels of Sicily, most of which are coasting vessels, amount to about 1400, besides fishing-boats. The maritime trade of Sicily is carried on chiefly in Genoese, Austrian, French, Spanish, and other foreign ships.

The principal towns of Sicily are:—PALERMO, MESSINA, CATANIA, SYRACUSE, AGOSTA, TRAPANI, GIRGENTI. Among the inferior towns, the following deserve notice:—Melazzo, Patti, Taormina, Castro Reale, and Randazzo, noticed under MESSINA (INTENDENZA); Termini, Cefalù, Corleone, Monreale, and Carini, noticed under PALERMO (INTENDENZA); Caltagirone, Nicosia, Aci Reale, Paternò, Aderno, and S. Filippo d'Argiro, noticed under CATANIA; Sciacca, Castronovo, Bivona, and Aragona, noticed under GIRGENTI; and MARSALA, ALCAMO, and ALICATA, noticed under their respective heads.

The other towns which deserve notice are:—1, Castelvetrano, near the site of the antient Entella, a town of 12,000 inhabitants, in a romantic situation on a hill in the province of Trapani: the ruins of the antient Selinus are a few miles south of Castelvetrano, near the sea-coast. 2, Mazzara, a bishop's see, and a town of 10,000 inhabitants. 3, Caltanisetta, a considerable town in the interior of the island, with above 20,000 inhabitants, and numerous churches and convents. 4, Caltabellotta, a town of 7000 inhabitants, on a hill north of Sciacca. 5, Castrogiovanni, near the site of the antient Enna, a town of 12,000 inhabitants. 6, Calataxibet, or Calascibetta, a town of 6000 inhabitants, in the centre of the island, near Castrogiovanni. 7, Terranova, near the site of the antient Gela, on the south coast of the island, with about 9000 inhabitants, carries on a considerable trade by sea. 8, Modica, the capital of one of the finest and best-cultivated districts in all Sicily, has numerous churches and convents, and about 24,000 inhabitants. The finest cattle in Sicily, the finest wool, and the best cheese and butter, belong to the district of Modica. 9, Piazza, with 18,000 inhabitants and a bishop's see, situated on a hill half-way between Castrogiovanni and Caltagirone. 10, Noto, in the south part of the island, a considerable town, with numerous convents and churches, and 18,000 inhabitants. 11, Castellamare, on a gulf on the northern coast, between Palermo and Trapani, has a strong castle, 4000 inhabitants, and large granaries: it carries on a considerable trade by sea. 12, Palma, a well-built town, on a hill not far from Alicata. 13, Salemi, a town in the west part of the island, built by the Saracens, near the site of the antient Alicia, has about 12,000 inhabitants. 14, Lentini, the antient Leontini, has 6000 inhabitants and some good buildings; but the air is considered unhealthy in summer. 15, Carlentini, with 4000 inhabitants. 16, Geraci, north-west of Nicosia, with 4000 inhabitants. Besides these, there are many other towns of less note, such as Calatafimi, Partanna, Leonforte, Ragusa, Naro, &c. Sicily has many towns containing above three thousand inhabitants, as the country population live chiefly in towns, and not in cottages dispersed about the country.

The small islands belonging to Sicily are—I. The group of the Lipari Islands. [LIPARI.] II. The group of the Trapani Islands—1, Favignana, the antient Ægusa, about sixteen miles from the mainland of Sicily, is eighteen miles in circumference: it has good anchorage-ground for large vessels, and a strong castle. It is used as a place of banishment for criminals. Favignana has good pastures and copious springs. A number of sheep are reared on this island, and the surrounding sea abounds with fish. The woods contain hares and deer. 2, Maretimo, the antient Hiera, west of Favignana, and farther out at sea, is eleven miles in circuit; it is rocky and naked, and the coast is bold and steep: wild thyme grows in abundance, and supplies nourishment for swarms of bees. It has a strong castle with dungeons for state-prisoners. 3, Levanzo, the antient Buccina, north of Favignana, and about ten miles distant from the point of Trapani, is eight miles in circuit, and has some good pastures. 4, The group of small rocky islands, dangerous to navigators, called antiently Ægades, and now Formica and Scoglio di Mezzo, are between Levanzo, Favignana, and the mainland, near which the consul Lutatius defeated the Carthaginian fleet at the end of the first Punic war. 5. The group of small islands south-east of Favignana, and near Cape Lilybæum, one of which is the antient Motya, once a settlement of the Phœnicians, and afterwards a stronghold of the Carthaginians, which was destroyed by Dionysius the elder. A Punic inscription, found on the island in 1779, was transferred to the town-house of Marsala, where it probably still remains. III. The island of Ustica, forty miles north by west of Palermo, is about eleven miles in circumference; the surface is hilly; it contains many olive and other trees, and large cisterns cut in the rock, as well as sepulchres and other traces of antient colonization. Ustica was for centuries deserted, owing to the island being exposed to the depredations of the Barbary pirates, until the year 1759, when a fresh colony was sent to it, with a garrison, and several small forts were built: the population is now in a thriving condition. IV. The island of Panteilaria, the antient Cossyra, is situated between the south-west coast of Sicily and the coast of Tunis east of Cape Bon, from which it is about forty miles distant. It is sixty miles from the nearest point of Sicily south of Mazzara. Pantellaria is about thirty-six miles in circumference; the ground is in great part of volcanic formation, and produces vine and olive trees, cotton, pulse, and pasture, but little corn. The inhabitants, to the number of 3500, are remarkably industrious. The island has several creeks with good anchorage-ground. An herb called orseglia, which grows on the island, is used for dyeing. There is a warm soapy spring, which is used for bleaching and scouring linen, and other mineral springs, which are of use in several complaints. A copious spring in the middle of the island furnishes the inhabitants with drinkable water. There is a town, with several churches, and a castle with a garrison sent from Sicily. V. South of Pantellaria, towards the coast of Tripoli, are the two uninhabited islands of Linosa and Lampedosa. Linosa, which is the smaller, is destitute of water, but Lampedosa has a good spring and good anchorage-ground, and a soil capable of cultivation, and it was once inhabited. Lampedosa gives the title of prince to a Sicilian family. During the last war the English from Malta sent a colony of Maltese to Lampedosa, with a detachment of soldiers for their protection, but the island was afterwards abandoned. Lampedosa is about ninety miles west by south of Malta, 130 south-west of the nearest point of Sicily near Alicata, and about 75 miles east of Cape Mahadiah on the coast of Tunis. Linosa is about 30 miles north-east of Lampedosa. The crown of Sicily used to receive feudal homage from the grand-master of the order of Malta, that island, as well as Gozo, having formerly been subject to the king of Sicily.

The best harbours on the coast of Sicily are those of Messina and Syracuse, which are perfectly safe; and the latter particularly is capable of containing a fleet of large ships of war. The ports of Palermo, Agosta, and Trapani are next in importance. But the southern coast is destitute of harbours: that of Girgenti is only fit for small craft, and therefore this large tract, called 'la Costa di Mezzogiorno,' is dreaded by Mediterranean sailors, who consider it a dangerous lee-shore. Until of late years Sicilian vessels seldom ventured beyond the coast of Italy, but they now begin to trade as far as South America.

(Serristori, *Statistica d'Italia*; *Descrizione Geografica dell' Itala di Sicilia*, anonymous, 2 vols. small 8vo., Palermo, 1806; Paternò, *Viaggi per la Sicilia*, 1817; Ortolani, *Nuovo Dizionario Geografico Statistico della Sicilia*, 1819.)

We shall conclude this sketch of Sicily with a few remarks. The economical condition of Sicily is in a state of transition. Until 1812 the best part of the cultivated land in the island belonged to the barons, the church, and to several corporate bodies, as fidei-commissa, and were incapable of being alienated. This mass of property was consequently unimproved. Most of the estates were also encumbered with mortgages, the interest of which absorbed a great part of the annual rent, but the interest was not regularly paid, owing to the insufficiency of the laws against debtors, and especially noble debtors. Most of the barons lived in the large towns, or at Naples near the court, neglecting their estates, ignorant of their own financial affairs, trusting implicitly to agents and lawyers, squandering their income, borrowing more and more, and feeding a host of domestics, dependents, and parasites. The eldest son alone was allowed to marry; the younger had only a small annual allowance, and the daughters generally passed their life within the walls of some convent. The wants of the crown during the war, and the influence and example of England, which by its land and sea forces defended Sicily from invasion, brought about the convocation of the national parliament, which undertook a revision of the constitution.

In the night sitting of the 18th of July, 1812, the barons, greatly to their honour, voluntarily gave up their own feudal privileges, which constituted a large part of their revenue. It was a burst of enthusiasm for the public benefit, and no compulsion of despotism or of foreign invasion, as at Naples, which effected the abolition of feudalism in Sicily. The circumstances of the time, the continental system of Napoleon, the supply of provisions required for the English armies and fleets in Sicily and Spain, the annual subsidy paid by England to Sicily, and the expenditure of the English army stationed in the island, produced an extraordinary rise in prices, which compensated the barons for the loss of their feudal rights. After the peace of 1814, the opening of the continental ports, and the departure of the English forces, prices fell suddenly and rapidly. At last, in 1820, prices fell to one-tenth of what they were in 1810. The landed proprietors found their income dwindling away, but the institution of the fidei-commissa remained, and prevented them from alienating their property. A royal decree of 1818 abolished the fidei-commissa, and introduced better laws for the protection of creditors. The consequence was that a vast mass of property was at once brought into the market, and produced a general depreciation. Many families, supposed to be rich, found themselves all at once poor. A law of 1824 enabled debtors to assign their land for the liquidation of their debts. Many of the barons, learning wisdom from necessity, reduced their establishments, left their town residences at Palermo and Naples, and retired to their remaining estates, or to the provincial towns near their estates; others sought for employment under government, and other means of subsistence. From this temporary derangement of the old economical system has resulted the good effect of putting into circulation a vast mass of property, which, being divided into smaller portions, will be improved. But the change has remained imperfect, inasmuch as a large amount of property still belongs to the church and monasteries, whilst government interference in the sale of agricultural products, restrictions upon importation and exportation, vexatious local duties, and the want of roads in a country of mountainous surface, tend to depress rural industry, especially in the interior districts. Agricultural instruments are still extremely imperfect; a rotation of crops is unknown; there is no manuring of the land, no shelter for cattle; the mountains are generally stripped of their trees; and popular education is so neglected that not above one-tenth of the people can write. An impulse however has been given, and it depends greatly on the Sicilian landholders to continue it by improving the agriculture of their estates. The government on its part is not altogether idle; the carriage-roads in progress, the sale of communal lands, the abolition of several injudicious duties, are evidence of the administration being alive to the interests of the Sicilian population. The custom-house tariff is still, as in most continental states, established on a prohibitory system, with a view of encouraging national industry; and this supposed encouragement, especially in a country essentially agricultural, like Sicily, is the main obstacle to the development of its industry. Our authorities for the present state of Sicily are—

Serristori, *Statistica d'Italia*, 1836; De Welz, *Saggio su i Mezzi di moltiplicare prontamente le Ricchezze della Sicilia*, 1822; Afan di Rivera, *Considerazioni su i Mezzi da restituire il Valor proprio ai Doni che ha la Natura conceduto al Regno delle Due Sicilie*, 1833.

Those who wish to know the state of Sicily at the beginning of the present century may consult Balsamo, *Present State of Sicily*, translated by Vaughan, 1811; Rehfues, *Neues Zustand der Insel Sicilien*, 1807; and an anonymous book, entitled *De la Sicile et de ses Rapports avec l'Angleterre à l'Epoque de la Constitution de* 1812, *par un Membre des différens Parlemens de Sicile*, Paris and London, 1827.

The antient Sicilian population was formed out of a mixture of various nations, Sicani, Siceli, and Greek colonists. There was also an admixture of Punic blood, and afterwards of Roman and Campanian. After the fall of the Western Empire, the Byzantine Greeks remained masters of the island, till the Saracens came, and the Arab and Moorish race remained in Sicily for more than two centuries. Then came the Normans, and after them the Aragonese or Spaniards, who gained a lasting footing in the country. From all these races the actual Sicilians are derived, but it may be presumed that the indigenous Sicilian and the Greek and Punic blood are the three preponderating elements. Accordingly there is considerable difference of complexion and appearance among the inhabitants. The Sicilians are generally dark, and yet we sometimes see complexions as fair as in the north of Italy. Unless bent down by poverty or disease, the Sicilian exhibits a spare but muscular and erect form, lively dark eyes, great elasticity of limb, and quickness of motion. He is shrewd, quick-sighted, and very imitative. Although the climate and the state of society incline him to indolence, he is more easily roused into activity than the Neapolitan, and is more capable of perseverance. It has been remarked that of all the countries of Europe which were partially occupied by the English during the last war, Sicily was that in which they found most sympathy, and that sympathy is not yet obliterated. The Sicilian is naturally impassioned and amorous, fond of music and of song; he is prone to revenge, but is susceptible of a high degree of social refinement. He is generally temperate and frugal, and has naturally a strong feeling of dignity and independence, unless debased by an abject social condition, when at times he sinks into the extreme of degradation. Considerable corruption of morals prevails in the large towns. The Sicilians had formerly the reputation of being jealous, like the Sardinians, Corsicans, and Calabrians, but the progress of civilization, or corruption, has nearly obliterated that feeling, and intrigue especially with married women, is carried on in the towns with as much impunity as in the cities of continental Italy. Still, taken as a nation, there are elements in the Sicilian mind superior to those of most other parts of Southern Italy. The Sicilian women are handsome, fascinating, and amorous; and their countenances often exhibit a strong admixture of Greek features. The Sicilian oral language is a dialect of the Italian, and as such is noticed under the head ITALY—*Language and Literature of*. The modern Sicilian dialect can boast of Meli, a lyric poet equal if not superior to his Græco-Sicilian countryman Theocritus. [MELI, GIOVANNI.] All educated persons speak the pure Italian with more or less of an accent. The Sicilians exhibit a considerable facility for acquiring foreign languages, and greater facility than their neighbours the Neapolitans. Sicily has produced in all ages a number of men of learning, and the literary history of Sicily has been illustrated by Mongitore, 'Bibliotheca Sicula;' Ragusa, 'Elogia Siculorum qui Literis floruerunt;' and Scinà, 'Prospetto della Storia Letteraria di Sicilia,' 3 vols. 8vo., Palermo, 1827.

Antient History of Sicily.—The legends of the Greeks speak of the giants, Cyclops, and Læstrygonians who inhabited Sicily previous to the epoch of the Trojan war. The Sicani are next mentioned, who are said by some to have been Iberians (Thucyd., vi. 2), from the river Sicanus in Iberia. Other writers consider the Sicani to be aborigines of Sicily. (Diodorus, v. 2.) The island is sometimes called Sicania, from the Sicani. According to tradition, Ceres taught the Sicani to plough the ground and sow corn; Aristæus taught them to cultivate the olive-tree and rear bees; Dædalus the art of building, and his nephew is said to have invented the saw and other mechanical instruments. Hercules next visited Sicily, built Soloeis and Motya and other towns, established laws, and repressed and punished robbers. Through the veil of these legends it is easy to perceive the history of the transition of Sicily from a savage to a civilised state. The Siculi (Σικελοί) next came from Italy, and occupied the eastern part of Sicily about three hundred years before the Greeks made any settlement in the island. The Siculi drove the Sicani to the southern and western parts of the island, to which they gave the name Sicelia. (Thucyd., vi. 2.) They built Zancle, Agyra, Enna, Erbessus, and Hybla. The Phœnicians are said to have colonised Panormus, Soloeis, and Motya. Then came the Elymæi, who are said to have built Elyma, Entella, and Egesta. In the year 759

B.C., a colony of Chalcidians from Eubœa, and Megarians, led by the Athenian Thucles, landed on the eastern coast of Sicily, where they found the country deserted, the Siculi having withdrawn to the interior in consequence of the irruptions of the Etruscans or Tyrrhenians. These Greek colonists built the town of Naxos. In the following year a party of Corinthians and other Dorians, led by Archias, landed in the island of Ortygia, defeated the Siculi who inhabited it, and laid the foundation of the great city of Syracuse. Four years later, the Greeks of Naxos drove the Siculi out of Leontini and Catana, and occupied those towns. About 712 B.C. a party of Rhodians and Cretans built Gela on the southern coast. In course of time, both Syracuse and Gela sent colonies to other parts of the island; a colony from Gela built Agrigentum (Girgenti), or, as the Greeks called it, Acragas, and the Syracusans colonised Camarina. A colony of Megarians settled at Hybla, and afterwards built Selinus, 651 B.C. Colonies from Zancle founded Mylæ and Himera. The interior of the country remained in possession of the Siculi, under their respective princes. The Greek towns governed themselves at first as republics, mostly aristocratic, as Dorian towns generally were; afterwards some citizens rose to be tyrants or permanent chief magistrates. Hippocrates, tyrant of Gela, was one of the oldest and most distinguished among these. He flourished about 495 B.C. He defeated the Siculi, took Naxos and Leontini, and obliged the Syracusans to give up Camarina. Having joined Anaxilas, tyrant of Rhegium, they surprised Zancle, and shared the plunder between them. Anaxilas then invited a party of Messenians to colonise Zancle. Phalaris was tyrant of Agrigentum about B.C. 565 to 550. Many stories, probably exaggerated, are told of his cruelty. He however extended and consolidated the power of Agrigentum. Phalaris was killed in a popular insurrection, and about sixty years later Theron was tyrant of Agrigentum. He raised most of the splendid buildings of Agrigentum, and he conquered Himera, thus extending the dominion of Agrigentum from the southern to the northern coast of the island. His daughter Demarata married Gelon, tyrant of Syracuse, who was the most illustrious of the early Sicilian princes. Gelon and Theron together defeated the first invasion of the Carthaginians, 480 B.C., called in by the people of Selinus, and also by Therillus, tyrant of Himera, who had been driven away by Theron, and had taken refuge at Carthage. The history of that period is briefly narrated under **Gelon**. Syracuse and Agrigentum were now the preponderating states in Sicily. Gelon was succeeded in Syracuse by his brother Theron, tyrant of Gela, who died 467 B.C. [**Hieron I.**] His successor Thrasybulus being driven away by a popular insurrection, Syracuse adopted a democratic form of government.

The people of Agrigentum about the same time expelled their tyrant Thrasydæus, and restored the democracy. Empedocles is said to have framed a new constitution for Agrigentum; and Charondas did the same for Tauromenium, Catana, Himera, and the other cities of Chalcidic origin. Between 452 and 440 B.C., Sicily was distracted by an internal war between the Siculi, led by their king or chief Deucetius, and the states of Agrigentum and Syracuse. It terminated with the destruction of Trinacria, a stronghold of the Siculi, after a desperate resistance of the inhabitants. The site of Trinacria is not ascertained, but it is supposed to have been near Palica, east of Caltagirone, and on the western border of the great plain of Catania. The Syracusans next attacked Leontini. This was a war of races; the Doric cities taking part with Syracuse, and the Chalcidic cities with the Leontini. The latter, being the weakest, applied to the Athenians for assistance. The first Athenian expedition to Sicily took place 427 B.C., but it led to no decisive result. A truce was concluded between the Sicilian towns, and the Athenians withdrew their fleet B.C. 425. A new quarrel between Egesta and Selinus led to the second Athenian expedition to Sicily, 415 B.C., which terminated fatally for the Athenians. [**Alcibiades**; **Syracuse**.] The Egestans, being left at the mercy of their enemies of Selinus, applied to Carthage, and this led to the second invasion of Sicily by the Carthaginians (409 B.C.), who, under the command of Hannibal, son of Giscon, took and plundered Selinus and destroyed its splendid temples. Selinus, though it continued to exist afterwards for a time, never recovered from that blow. The Siculi of the interior having joined the Carthaginians, their united forces attacked Himera, which stood on the north coast, on the site of the modern Termini, took it and destroyed it completely, 240 years after its foundation. The Carthaginians next attacked the powerful city of Agrigentum, and after a long siege took and destroyed it, 406 B.C. [**Agrigentum**.]

The Carthaginians now settled in Sicily, where they remained for about a century and a half, till the first Punic war. Syracuse was the only city that effectually opposed Carthage and prevented its dominion extending over the whole island. After a succession of wars between Carthage and Syracuse, a brief summary of which is given under **Dionysius** the elder and **Timoleon**, a treaty was concluded about 340 B.C., by which the Carthaginians retained possession of the western part of the island, the river Halycus near Mazzara forming the boundary of their dominions on that side. Lilybæum in the south, Eryx in the west, and Panormus in the north, were the principal settlements of the Carthaginians, and they flourished by commerce. The other towns formed a league, of which Syracuse was the head. Timoleon invited fresh Greek colonies to repeople Agrigentum, Agyra, Gela, and other places which had been devastated during the war. The history of Sicily from the time of Dionysius the elder becomes in great measure identical with that of **Syracuse**.

The Carthaginians availed themselves of the civil dissensions of Syracuse, and of a war between Agathocles, tyrant of that city, and the people of Agrigentum, to interfere as mediators, when in reward for their mediation they secured an extension of territory, by which Selinus, Heraclea, and the Thermæ Himerenses (hot-springs of Himera) were included within the Carthaginian possessions, which now extended eastward to the river Himera. A war broke out between Syracuse and Carthage about 310 B.C., the particulars of which are related under **Agathocles**. Peace was concluded after his death, but fresh civil dissensions within Syracuse encouraged the Carthaginians again to attack that city, which then called Pyrrhus to its assistance. Pyrrhus came and drove the Carthaginians out of the island, with the exception of the strong town of Lilybæum, which he could not take, and he suddenly abandoned Sicily to its own dissensions and the mercy of the Carthaginians. [**Pyrrhus**.] It was lucky for Syracuse in this emergency that it found a citizen equal to the task of saving his country. The sequel is narrated under **Hieron II.**

The following struggle in Sicily between Rome and Carthage is found under the head of **Punic Wars** (the first.) At the end of that war the Romans succeeded the Carthaginians in the possession of the western part of Sicily. Hieron II., king of Syracuse, retaining possession of the eastern part as ally of Rome. His son Hieronymus imprudently quarrelled with Rome during the second Punic war, and the result was the conquest of Syracuse by the Romans after his death [**Syracuse**], and thus the Romans became possessed of the whole island, which they administered as a province under a prætor. The character of that administration has been transmitted to us through Cicero in his 'Orations against Verres.' Although all Roman governors of Sicily were probably not so bad as Verres, there is evidence enough to show that the fearful decay into which that fertile and once wealthy country was reduced at the time of Cicero, had been the gradual work of long years of misgovernment, which made the Sicilians regret the former dominion of Carthage. 'All our provinces are in tears,' exclaims Cicero, 'all free people have complaints against us, and lastly all kings remonstrate against our rapacity and our injustice. There is no place, however remote or concealed within the expanse of the ocean, whither the report of the iniquity and licentiousness of our men has not extended. In these times the Roman people can no longer bear the burthen, not of the violence or war of other nations, but of their wretchedness, their tears, their complaints and execrations.' (Cicero *in Verrem*, iv. 89.)

The consequences of Roman misgovernment are exhibited in striking language by the same orator:—'Those very fields and hills which I had once seen in all their verdant pride and beauty, look now squalid and forsaken, and appear as if mourning for the absence of the husbandman. The fields of Herbita, of Enna, of Murgantium, of Machara, of Assorium, of Agyra, are mostly deserted, and we looked in vain for the masters of so many fertile jugera of land. The vast fields round Ætna, once the best cultivated, and those of Leontini, the pride of corn countries, which when sown seemed to defy scarcity, have become so degenerated and wasted, that we in vain looked for Sicily in the most fertile part of Sicily.' (*In Verrem*, iii. 18.)

About the year 134 B.C. the first servile war broke out in Sicily, caused by the ill treatment of the numerous slaves who had become almost the only cultivators of the soil. The insurrection began at Enna, among the slaves of Damophilus, a wealthy proprietor noted for his inhumanity. The insurgents killed him; and his wife Megallida, who was as cruel as himself, was given up to be tortured to death by her female slaves. Her daughter, who had always shown herself compassionate and kind, was sent safe to some of her relatives at Catana. The insurgents, under the leadership of a Syrian named Eunos, being joined by thousands of their fellow-slaves, took possession of Enna, ravaged the country around, defeated four Roman prætors, and surprised Tauromenium. At last the consul Rupilius, being sent against them with a powerful army, retook Tauromenium by famine, and Enna after a desperate resistance. The recaptured slaves were put to death. (132 B.C.)

About 102 B.C. another and more formidable insurrection broke out in Sicily, among a class of men born free, who had been brought thither from other Roman provinces, to be engaged as hired labourers, and were afterwards put in chains and confounded with the common slaves. A party of them gathered on a mountain near Bivona, defeated the Roman troops, and being joined by another host of slaves under a certain Athenion, a native of Cilicia, repulsed the Roman commander L. Licinius Lucullus near Triocala. The proconsul M. Aquilius, being sent to Sicily with a fresh army, defeated Athenion, who was killed in the fight, and destroyed most of the insurgents. He took prisoners one thousand of them, who were sent to Rome to die in the amphitheatre, fighting against one another for the entertainment of the Roman people. [ATHENION.]

During the war between Marius and Sulla, Pompeius was sent by the latter to drive away the partisans of Marius from Sicily. He conducted himself with comparative moderation; but on one occasion, the citizens of Messina remonstrating to him about some arbitrary acts, which were infractions of their acknowledged liberties, Pompeius exclaimed: 'Will you never cease holding forth your privileges to us who carry swords by our sides?'

Then came the prætorship of Verres and his wholesale spoliations of Sicily. During the wars of the Triumvirate Sicily was for a time in possession of Sextus Pompeius, who was at last defeated and driven away by Octavian. After his assumption of supreme power, Augustus restored many towns of Sicily which had been devastated during the late wars; he sent colonies to Tauromenium, Catana, Thermae Himerenses, the Centuripini, Panormus, Thermæ Selinuntiæ, Heraclea, and Syracuse. Finding the extent of this last city too large to be filled again, he contented himself with colonizing the island Ortygia, which has constituted ever since the modern town of Syracuse.

Little is known of the history of Sicily under the empire, except that Christianity spread early into the island, and that a persecution of the Christians took place under Nero. In the third century of our æra we find registered the names of bishops of Panormus.

About A.D. 440 the Vandals under Genseric landed from Africa on the western coast of Sicily and took Lilybæum. Theodoric, the Gothic king of Italy, added Sicily to his continental dominions. In the year 534 Belisarius reconquered Sicily for the emperor Justinian; and the island continued to be a dependence of the Eastern empire, and was administered by a governor styled 'Patrician,' who was sent from Constantinople.

About the year 826, under the reign of the Eastern emperor Michael the Stammerer, a certain Euphemius, a Byzantine officer who commanded the imperial troops in Sicily, fell in love with a Sicilian maid of noble birth who was a nun, and took her by force from her convent. Complaints having been laid before the emperor, Euphemius was outlawed. He then revolted, and defeated the Patrician Photinus, but not being strong enough to withstand the imperial forces, he sailed over to Africa and invited the Aglabide Emir of Kairwan to effect the conquest of the island. In June, 827, the first Saracen expedition landed in Sicily, took Agrigentum and Minoa, and, after several years' fighting, took Messina in 831, and Panormus in 835. It was not till 878 that the Saracens took Syracuse by storm. Soon after the Saracens of Sicily threw off their dependence on the Emirs of Kairwan, and several battles took place between the African and the Sicilian Saracens. The great Mohammedan schism at the beginning of the tenth century having raised to the Caliphate of Africa the Fatimide El Mehad, Sicily, after some resistance on the part of the Sicilian Saracens, became subject to his power, A.D. 910. In 945 the Fatimide Caliph Al Mansur appointed an emir as permanent and hereditary governor of Sicily, who fixed his residence at Panormus. Under the rule of the emirs Sicily enjoyed a more orderly government and comparative tranquillity. Tauromenium, the last hold of the Byzantines, was taken by the Saracens in 962. In 964 Nicephorus Phocas sent a strong armament to recover Sicily. A battle took place near Rometta, in which the Saracens totally defeated the Byzantine army, with the loss of 10,000 men. After this Sicily was governed by a succession of emirs, nominally dependent on the Fatimide caliphs, who had themselves degenerated from the vigour and activity of the founders of their dynasty. In 1035 a revolt broke out among the Sicilian Saracens against the Emir El Achal, who was killed, and his brother El Hassan was driven away. In every town the leading Saracens assumed the local power, and thus Sicily became a prey to anarchy, which favoured the invasion by the Normans. The sequel of the history of the island is given under SICILIES, Two—*History of*.

The Saracens never formed the bulk of the population in Sicily. There are sufficient grounds to believe that they did not muster at any time more than between 200,000 and 300,000, or about one-sixth of the actual population. The Christians enjoyed the free exercise of their religion, paying a tribute like other conquered subjects in Mohammedan states. They had their bishops and their convents. But they had no political rights, and were subjects of the conquering race. The Arabian historians Nuweiri and Sheabodin, and the geographer Edrisi, afford information concerning the condition of Sicily during the Saracen period. Rosario da Gregorio published in 1790 an important collection: 'Rerum Arabicarum quæ ad Historiam Siculam spectant ampla Collectio,' in Arabic and Latin.

Of the numerous remains of antiquity existing in Sicily the most important are noticed under SYRACUSE and AGRIGENTUM. Taormina has an antient theatre in tolerable preservation. The remains of the once splendid temple of Selinus, consisting of a mass of broken columns, cornice, triglyphs, and metopes, were examined, in 1823, by two English artists, Angell and Harris, of whom Harris died of the malaria on the spot. Three of the metopes have been restored, and are now in the Museum of the University of Palermo. (*Memoria sulle Opere di Scultura in Selinunte ultimamente scoperte*, by Pietro Pisani, Palermo, 1823; Thiersh, *Epochen der Bildenden Kunst*, p. 404, &c.) On the site of Segesta, or Egesta, not far from Trapani, is the portico of a temple consisting of 36 Doric columns standing, with frieze and cornice. Other remains of antiquity are seen at Catania, Lentini, Alicata, Messina, Mordica, Paterno, and other places. The antiquities of Sicily have been described by Swinburne; St. Non, *Voyage Pittoresque*; Biscari (Principe di), *Viaggi per le Antichità della Sicilia*; and many others.

SI'CYON (Σικυών) and **SICYONIA** (Σικυωνια), the territory of Sicyon. Sicyonia was situated on the south coast of the Corinthian Gulf, and near the eastern extremity of the gulf. In the time of Strabo (p. 382, Casaub.) the river Nemea was the boundary on the east between Corinthia and Sicyonia. On the west it was bounded by the territory of Pallene (Herod., i. 145), and on the south by the territory of Phlius. Sicyonia consisted of a plain country along the coast and a higher tract extending a few miles inland. The area cannot be ascertained; it perhaps fell short of 100 square miles. The Asopus, a small stream, rose in the Carneates Mountain, which was a portion of the mountain of Coelossa, and passing through a part of Sicyonia, gave its name to a district called Asopia. In proceeding along the coast from the harbour of Sicyon to Aristonautae, the naval station of the Pellenaeans, that is, westward, the small streams Helisson and Sythas were crossed. The Sythas was the boundary between Sicyonia and Pellene. In going from Corinthia to Sicyonia, the Nemea was first crossed and then the Asopus. The old name of Sicyon was Aegiale, or Aegiali, which was afterwards changed into Mecone, and still later into Sicyon, from Sicyon, an Athenian, who came to the aid of Lamedon, king of Sicyon, against Archander and Architeles, the sons of Achaeus.

Sicyon, the chief town, was, according to some accounts, twenty, and, according to others, twelve stadia from the sea. The old town was on the coast, and it became the port when the new town was built. (Strabo., p. 382.) Pausanias (ii. 6) says that Demetrius the son of Antigonus pulled down the city in the plain and built the then city close to the antient Acropolis, which is the same event that is referred to by Strabo (p. 382), where the name of Demetrius is corrupted into Demeter. (Compare Diodorus, xx. 102.) The summit of the Acropolis was flat and of some extent; it was surrounded by steep precipices, and was well supplied with water. This was the city which Pausanias visited, and which he has described. In his time many of the public buildings were in a ruinous state; but it still contained works of some of the great sculptors of Greece, as Canachus, Scopas, and Lysippus. Between Sicyon and Phlius, sixty stadia from the former and forty from the latter, was Titane, situated in a mountainous country. A road led direct from Sicyon through Titane to Phlius.

Aegialeus, according to tradition, was the founder of Sicyon, and he gave his name to all that part of Peloponnesus which was called Aegialos. The mythical history of Sicyon is given at some length by Pausanias (ii., 5, 6). Temenus, the son of Phalces, surprised Sicyon and took possession of it with his Dorians, and from that time the Sicyonians became Dorians and a part of the Argeia.

Contemporary with Megacles, the son of the Athenian Alcmaeon, was Cleisthenes, tyrant of Sicyon, whose daughter Agariste was given by her father in marriage to Megacles (Herod., vi. 126, &c.), an event which greatly increased the consideration of the Alcmaeonidae. The Sicyonians sent 3000 hoplites to the battle of Platæa; and they had 15 ships at the battle of Salamis. In the interval between the Persian and the Peloponnesian war, the territory of Sicyonia was ravaged by the Athenian Tolmides, who defeated the army that was opposed to him; and the Sicyonians were again defeated by Pericles (B.C. 454), who landed in their country. In the Peloponnesian war the Sicyonians joined the Spartan confederation. (Thuyd., ii. 9.) The subsequent political history of Sicyon is little known, until the Macedonian period and the wars of the Achaean league, when it was raised to importance by Aratus. [ARATUS.]

As a school of art, Sicyon holds a distinguished rank; and one of the great styles of painting took its name from this little state. This school was founded by Eupompus, and it produced Pamphilus and Apelles. [PAMPHILUS.] Sicyon was also one of the most antient seats of the plastic art. Pliny says (*Nat. Hist.*, xxxvi., c. 3) that Sicyon was long the parent country of all works in metal. Dipoenus and Scyllis carried their art to Sicyon, probably about B.C. 570, but the earliest native artists of note were Canachus and his brother Aristocles, who were probably contemporary with the Pisistratidae. Lysippus was also a native of Sicyon. [SCULPTURE, p. 126.]

SIDA, a genus of the natural family of Malvaceæ, containing nearly two hundred species, which are very extensively distributed throughout the warm parts of the world, and abound in the peninsula and plains of India. The name was originally applied by Theophrastus to a plant growing in moist situations, which is believed to have been an Althæa, also belonging to the family of Malvaceæ, and was adopted by Linnæus for this genus. Sida is characterised by having a naked quinquifid calyx with valvate segments. Corol with five petals, which are obovate, with the claws often united into a tube, and joined to the bottom of the stamen tube. The stamens numerous, with their filaments connected into a columnar tube at their base, and free at the apex, bearing the reniform anthers. The styles are numerous, but more or less united at the base. Capsule five or many celled. Cocci single-seeded; seeds suspended, roundish, and flattened.

The species of this genus vary much in habit, as well as in the structure of their fruit and seeds, but they resemble each other, as indeed do all Malvaceous plants, in abounding in mucilage, and in some of them having tough ligneous fibres, which are employed for the purposes of cordage in different countries. From their mucilaginous nature several are employed as demulcents in India, such as *Sida Indica*, *Asiatica*, and *populifolia*, in the same way that the mallow and the marshmallow are in Europe. The leaves of *S. carpinifolia* (a native of Brazil and the Canary Islands) are chewed by the Brazilians, and applied with success to the stings of wasps and bees. *Sida rhomboidea* and *S. rhombifolia* abound in very delicate flax-like fibres, which may be used for many of the same purposes as hemp and flax; but when the plants are grown for the sake of their fibres, they ought to be sown thick, under which circumstances, like other plants similarly sown, they grow tall and slender without branches. So *S. periplocifolia*, a native of the Malay islands, which succeeds well in India, may be cultivated for the same object, especially as when cut near the earth it quickly shoots into long simple twigs which abound in flax-like fibres. A species, *Sida tiliæfolia*, is actually cultivated for this purpose in China. Seeds of this species were received at the Calcutta botanic garden under the name of *King*-ma from Pekin, in the neighbourhood of which the plant was said to be cultivated as a substitute for hemp and flax. At Rio Janeiro the straight shoots of *S. macrantha* are employed as rocket-sticks.

SIDE. In modern mathematics this term means nothing but one of the lines which bound a figure, extending from one angle or corner to the next. The Latin word *latus*, of the same signification, is preserved in composition: thus a figure of three sides is trilateral; of four, quadrilateral; of five, quinquilateral; and so on. At the introduction of algebra, the same geometrical analogies by which a number multiplied by itself was called a *square*, procured for the number itself the name of *side;* thus 7 being the side, 49 was the square; and the same of the cube, triangular, polygonal, and pyramidal numbers. [NUMBERS, APPELLATIONS OF.]

In common language the side is a vague term, implying only 'part, with a notion of relative position:' it is also differently used in and out of composition. First we have the *in*side and *out*side; then, with reference to either of these, we have sides before and behind, above and below, right and left. The first pair is defined by reference to the spectator, the second by the direction of gravitation; but the third, with reference to which the term side is most frequently used, cannot be defined by the mathematician. The anatomist will say, that in the human body, the right side is that on which the heart is not, and the left side that on which it is, and there is no other definition. In every case in which the terms right and left are applied, there is a reference to the position of the human body. Thus the right wing of an army means that which is towards the right hand of those in the centre; as soon as a retreat commences, the names of the right and left wings are changed. The right bank of a river is by convention named on the supposition that the person who names it is looking down the stream, or seems the water flow from him. Perhaps some may doubt whether the superior and inferior parts, or the anterior and posterior, are in our language properly called sides; these we must remind that the words fore-side and back-side are very good English; and that in the phrase *upside down* we see the remains of the corresponding phrases up-side and down-side.

SIDEREAL (*sidus*, a constellation; *sideral* would be more correct), applied in astronomy to distinguish that which has reference to the fixed stars, from that which relates to the sun, moon, planets, or comets. See STAR as to general considerations, and TIME as to the distinction between solar and sidereal time.

SIDERITIS (from σίδηρος, iron), the name of a genus of plants belonging to the natural order Lamiaceæ. The species of this genus are numerous, and are inhabitants of Europe and the northern parts of Asia. Dioscorides mentions three species of Sideritis, which were celebrated for staunching blood and healing wounds.

The genus consists of herbs and shrubs, with small yellowish flowers arranged in whorls; a tubular 5-cleft calyx, a ringent corolla, with upper lip 2-parted, the lower lip spreading, and deeply 3-cleft; four didynamous stamens, the upper short, bearing 2-celled anthers, the lower ones longer, and bearing irregular empty anthers; an inclosed style, biped at the top, with one of the stigmas shorter and embracing the other.

S. Romana, Roman iron-wort, is an annual, clothed with soft rather wooly hairs, with oblong-ovate leaves; a nearly glabrous calyx, with long mucronate teeth, the upper tooth large and ovate, the lower teeth lanceolate. This plant is a native of the Mediterranean. It was found by Dr. Sibthorp in Greece and the isles of the Archipelago; and Sir J. E. Smith believes it to be identical with the Sideritis of Dioscorides. It flowers from June to August, and attains a height of about six inches.

S. canariensis, Canary Island iron-wort, is a shrub clothed with villous wool; it has ovate, crenate, thick wrinkled leaves, veiny beneath, and clothed with a villous wool on both surfaces; flowers arranged in whorls. This, with many other of the species, is a native of the Canary Islands. It attains a height of from 3 to 6 feet, and is often cultivated in our gardens. Another species frequently grown in gardens is the Syrian or sage-leafed iron-wort (*S. syriaca*): it is an under-shrub, and clothed with white wool like the last; its leaves are thick, of an oblong lanceolate shape, and narrow at the base. It is a native of Candia and Palestine, and grows to the height of from 1 foot to 1½. All the shrubby species of this genus are adapted for growing on rock-work, or on dry gravelly chalky soils. They are readily increased by seeds, cuttings, or layers. The seeds of annual kinds may be sown in spring, in dry light soils; and the cuttings or layers may be planted out or laid down in the summer, and when rooted may be removed to pots. Most of those from the Canary Islands are greenhouse plants, and afford a variety in collections.

SIDEROLI'NA. [FORAMINIFERA, vol. x., p. 348.]

SIDERO'XYLON (from σίδηρος and ξύλον), a genus of plants belonging to the natural order Sapotaceæ. The species of this genus are natives of Africa, America, the East Indies, and New Holland. They are evergreen trees with axillary and lateral fascicles of flowers. They are remarkable for the hardness and weight of their wood, which sinks in water, and the genus has hence derived the name of iron-wood. The *S. inerme* (smooth iron-wood) is a native of the Cape of Good Hope, and has long been cultivated in the greenhouses of Europe. None of the species however are at all remarkable for beauty.

SIDLAW HILLS. [GREAT BRITAIN, p. 403.]

SIDMOUTH. [DEVONSHIRE.]

SIDNEY, SIR PHILIP, was born Nov. 29, 1554, at Penshurst in Kent. He was the son of Sir Henry Sidney, the favourite of Edward VI., by whom Sir Henry was knighted and sent as ambassador to France. This gentleman is described by Sir R. Naunton, in his 'Fragmenta Regalia,' as 'a man of great parts,' and certainly the favour which he enjoyed in the reign of Mary, and which was continued to him by Elizabeth, who made him lord-deputy of Ireland and president of Wales, is strong evidence of the truth of this assertion. Abundant testimony to his wise government of Ireland is borne by Spenser and Sir John Davies, in their treatises on the state of that country. Sir Philip's mother was Mary, eldest daughter of John, duke of Northumberland, and sister to Robert Dudley, the favourite of Queen Elizabeth.

Young Sidney was placed at school at Shrewsbury. While there his father addressed a letter to him in the year 1566, full of sterling advice. This letter was published in 1591, by one Griffiths, a person formerly in Sir Henry's household. At this time Sidney was only twelve years old, but even at that early age his biographer and companion Lord Brooke states that he was distinguished for intelligence and for a gravity beyond his years.

In 1569 he was entered at Christ Church, Oxford, and is reported to have held a public disputation with Carew, the author of the 'Survey of Cornwall.' During his residence at Oxford, negotiations between his father and Sir William Cecil, as to a marriage between Sidney and Anne Cecil, were entered into, but from some unexplained cause never were matured.

In 1572 Sidney proceeded on his travels. Paris was his first halting-place; but on the occasion of the Massacre of St. Bartholomew he was obliged to shelter himself at the house of Sir Francis Walsingham, the English ambassador, to whom he had been introduced by his uncle, the earl of Leicester. After quitting that city, he visited Belgium, Germany, Hungary, and Italy. At Frankfort he first became acquainted with Hubert Languet, who addressed a volume of letters to him. He arrived at Vienna in 1573, where he appears to have devoted considerable time to perfecting himself in horsemanship and other exercises peculiar to those times. At Venice he became acquainted with Edward Wotton, brother of Sir Henry Wotton, who is the *E. W.* referred to in the first lines of the 'Defence of Poesie.' He is stated also to have enjoyed the friendship of Tasso, but this statement cannot be verified. He returned to England in May, 1575.

On his return home Sidney at once became a courtier, and a very successful one. This is ascribed by Sir Robert Naunton to the influence of his uncle, the earl of Leicester. Naunton says he came 'famed aforehand by a noble report of his accomplishments, which, together with the state of his person, framed by a natural propension to arms, he soon attracted the good opinion of all men, and was so highly prized in the good opinion of the queen, that she thought the court deficient without him.' Connected with this success, is his first literary attempt, a masque, entitled the 'Lady of May,' which was performed before queen Elizabeth at Wanstead House in Essex.

Sidney rose in favour. In 1576 he was appointed ambassador to the court of Vienna on a message of condolation, the MS. 'instructions' of which are still extant in the Harleian Collection. Part of his mission was to condole with the two Counts Palatine, and in the execution of this duty he obtained the strong regard and friendship of Prince Casimir. He returned home in 1577.

About this time great excitement prevailed throughout England, owing to a negotiation for the marriage of the queen with Henry, duke of Anjou. The queen appearing at one time to lean somewhat favourably to this project, Sidney addressed to her the celebrated 'Remonstrance.' The very boldness of this famous letter seemed to preserve the author from any of the usual consequences of interference with the will of princes, for we find him in as high favour as ever; while inferior people who took the same views suffered mutilation and imprisonment. Soon afterwards a quarrel at tennis between the Earl of Oxford and Sidney, in which the latter behaved with great spirit, occasioned his retirement from court. Wilton, the seat of his brother-in-law the earl of Pembroke, was his retreat, and during this retirement the 'Arcadia' was written. He never completed it, nor was it even printed in his life-time. After his death, his sister collected the MS., and a continuation of it was written by Gervase Markham. It was published in 1590, under the title of the 'Countess of Pembroke's Arcadia.' Of this work the 'Retrospective Review' observes: 'Against the criticisms of its detractors (Lord Orford and Mr. Hazlitt) the best defence will be found in the work itself, to which we confidently refer our readers. That it has many faults, we will not deny. . . . . The feeling which the perusal of the "Arcadia" excites is a calm and pensive pleasure, at once full, tranquil, and exquisite.'

The 'Arcadia' was universally read and admired at the time of its publication, and gave perhaps a greater impulse to the national taste for the romantic style of fiction than any single work before or after it. It is now, like most of its class, almost forgotten. Admired and read by Cowley and Waller, it was also the companion of the prison-hours of Charles I. Milton says that the prayer of Pamela in the 'Ikon Basilike' is stolen from it. In 1581, the 'Defence of Poesie,' the great work of Sidney, and upon which his fame as an author rests, was composed, but did not appear until 1595. Nothing more can be said upon the cause which it advocates, and what is said is placed in such a point of view, and expressed in so happy a manner, as to leave nothing to desire. The names of Wither, Ben Jonson, and Warton are sufficient evidence of the high favour with which it has been received.

After sustaining a severe disappointment from the marriage of the Lady Penelope Devereux, whom he celebrated under the names of Philoclea in the 'Arcadia,' and Stella in his poems, and to whom he was most deeply attached, he married in 1583, Frances, only daughter of his old friend Sir Francis Walsingham. Shortly after he stood proxy for Prince Casimir at an installation of Knights of the Garter at Windsor, and received the honour of knighthood from the queen. In the ensuing year he took up the defence of his uncle, the earl of Leicester, who had been attacked by Parsons, the Jesuit, in a tract called 'Leicester's Commonwealth.' Sidney's answer is entitled a 'Discourse in Defence of the Earl of Leicester.' Early in the year 1585 he seems to have meditated joining Sir Francis Drake's second expedition against the Spaniards in the West Indies. The queen however, taking fright 'least she should lose the jewel of her dominions,' peremptorily forbade his embarkation. Fuller asserts that at this time also the crown of Poland was offered to him and declined.

The war between the Spaniards and the Hollanders was being carried on at this time. In order to mark her sense of his merits, the queen, in 1585, appointed him governor of Flushing. After some considerable successes against the enemy, the troops under his command accidentally met and encountered a force of about 3000 men who were marching to relieve Zutphen, a town of Guelderland. The engagement took place almost under the walls of the town. After having had a horse shot under him, and in his third charge, Sidney received a wound from a musket-bullet in the left thigh, a little above the knee. The anecdote related by Lord Brooke of his conduct on leaving the battle-field illustrates his character. Lord Brooke's words are—' In which sad progress, passing along by the rest of the army, where his uncle the general was, and being thirsty with excess of bleeding, he called for some drink, which was presently brought him; but as he was putting the bottle to his mouth he saw a poor soldier carried along, who had eaten his last at the same feast, ghastly casting up his eyes at the bottle. Which Sir Philip perceiving, took it from his head before he drank, and delivered it to the poor man with these words: "Thy necessity is yet greater than mine."' The wound was mortal, and after many days of severe suffering he died at Arnheim, in the arms of Lady Sidney and of his faithful secretary William Temple, on the 7th October, 1586, in the thirty third year of his age.

The body of Sidney was conveyed to England, and interred in Old St. Paul's Cathedral, on the 16th February, 1587, after lying many days in state. A general mourning, the first, it is believed, of the kind, was observed throughout the country. The funeral was attended by seven deputies, one for each of the Seven United Provinces, and by a great number of peers, his friends, and others.

The universities published three volumes of Elegies on his death. Spenser composed one on him under the title of 'Astrophel.' Constable contributed sonnets.

'Sir Philip Sidney was,' says the writer in the 'Retrospective Review' before quoted, 'a gentleman finished and complete, in whom mildness was associated with courage, erudition mollified by refinement, and courtliness dignified by truth. He is a specimen of what the English character was capable of producing, when foreign admixtures had not destroyed its simplicity or politeness debased its honour. Of such a stamp was Sir Philip Sidney, and as such every Englishman has reason to be proud of him.' His character has been a favourite theme. Near his own times, Nash, in his 'Pierce Penniless,' Lord Brooke, Camden, Ben Jonson, Sir Robert Naunton, and John Aubrey have all contributed to fill the ranks of his panegyrists. Sir Walter Raleigh called him the 'English Petrarch.' The chivalry of his character, his learning, generous patronage of talent, and his untimely fate combine to make him an object of great interest. 'He trod,' says the author of the 'Effigies Poeticæ,' 'from his cradle to his grave amid incense and flowers, and died in a dream of glory.'

Upon the whole, it may be said of Sidney's writings, that they display great brilliancy of imagination, with a chasteness of sentiment well calculated to refine the taste of the times. Their chief faults are chargeable on the strained and artificial style, the excess of which in all its absurdity may be found in that very curious work Lilly's 'Euphues.'

His 'Stella' afterwards caused great scandal by her unfortunate connection with Mountjoy, earl of Devonshire. Mrs. Jameson, in her 'Romance of Biography,' gives an interesting account of this lady. Sidney left one child, Elizabeth, countess of Rutland.

Besides the works before enumerated, he contributed poems to 'England's Helicon,' 'England's Parnassus,' and 'Davison's Rhapsody.' An English version of the 'Psalms' and 'Valour Anatomised into a Fancy,' published in 1581, attributed by some to Sir Thomas Overbury, are his other remains. For the modern reader, Gray's edition of his miscellaneous works, published at Oxford in 1829, leaves little to be desired.

(Wood's *Athenæ*; Fuller's *Worthies*; *Sidney Papers*; Sir R. Naunton's *Fragmenta Regalia*; *British Bibliographer*; Dr Zouch's *Life*.)

SIDNEY or SYDNEY, ALGERNON or ALGERNOON, was the second surviving son of Robert, second earl of Leicester of that creation, and of his wife Dorothy, eldest daughter of Henry, earl of Northumberland. He is supposed to have been born in 1621 or 1622. When his father went as ambassador to Denmark in 1632, he took his son Algernon with him; and four years after he likewise accompanied his father on his embassy to France. His first entrance upon public life was in 1641, when, upon the breaking out of the rebellion in Ireland, he went over to that country, of which his father was then lord-lieutenant, and commanded a troop of horse in the earl's regiment. Both he and his elder brother the Lord Viscount Lisle distinguished themselves by their gallantry in the campaigns of that and the following year.

Returning to England in August, 1643, the two brothers, who professed to be on their way to the king at Oxford, were seized as they landed in Lancashire, by order of the parliament; an incident which lost them the favour of Charles, who believed that their capture was of their own contrivance. On this they both joined the parliamentary party; and Algernon received a commission as captain of a troop of horse in the regiment of the earl of Manchester. In April, 1645, Fairfax raised him to the rank of colonel, and gave him a regiment; and in 1646, his brother Lord Lisle having become lieutenant-general of Ireland, he was made lieutenant-general of the horse in that kingdom, and governor of Dublin. In the beginning of the same year he had been returned member for Cardiff, in the room of William Herbert, Esq., who two years before had been disabled from sitting, for siding with the king, and who had in the interim been killed at the battle of Edgehill. In May, 1647, having come over to his native country, he received the thanks of the House of Commons for his services in Ireland; and was appointed governor of Dover. In 1648 he acted as one of the judges at the trial of the king, although he was not present when the sentence was passed, nor did he sign the warrant for the execution. On the establishment of the protectorate however he retired from public affairs, and he appears to have continued to reside at the family seat of Penshurst in Kent, and at other places in the country, during the government of Cromwell and his son.

But on the restoration of the long parliament in May, 1659, Sidney again came forward, and on the 13th of that month was nominated one of the council of state. On the 5th of June following he was sent, along with Sir Robert Honeywood and Mr. Borne, to Denmark, to negotiate a peace between that country and Sweden; and he was absent upon this mission when the king returned. In a letter written to him by his father shortly after the Restoration, and published in 'Familiar Letters, written by John, late Earl of Rochester, and several other persons of honour,' 8vo., Lond., 1697, the Earl mentions a report which he had heard, that when the university of Copenhagen brought Sidney their album, and desired him to write something in it, he wrote,—

'. . . Manus hæc inimica tyrannis
Ense petit placidam sub libertate quietem.'

and signed the verses with his name. This anecdote is confirmed by Lord Molesworth, who, in the Preface to his 'Account of Denmark' (first published in 1694), tells us, that even while Sidney was still at the Danish court, 'M. Terlon, the French ambassador, had the confidence to tear out of the Book of Mottoes in the king's library' the above lines, 'which Mr. Sidney, according to the liberty allowed to all noble strangers, had written in it.' 'Though M. Terlon,' adds Lord Molesworth, 'understood not a word of Latin, he was told by others the meaning of that sentence, which he considered as a libel upon the French government, and upon such as was then setting up in Denmark by French assistance or example.' His father intimates, that this and some other things he had heard of him made him hesitate about speaking to the king in his behalf, as he had intended to do. 'It is also said,' continues the Earl, 'that a minister who hath married a Lady Laurence here at Chelsea, but now dwelling at Copenhagen, being there in company with you, said, "I think you were none of the late king's judges, nor guilty of his death," meaning our king. "Guilty!" said you. "Do you call that a fault? Why, it was the justest and bravest action that ever was done in England, or anywhere else;" with other words to the same effect. It is said also that, you having heard of a design to seize upon you, or to cause you to be taken prisoner, you took notice of it to the king of Denmark himself, and said, "I hear there is a design to seize upon me; but who is it that hath that design? *Est ce nôtre bandit?*" by which you are understood to mean the king. Besides this it is reported that you have been heard to say many scornful and contemptuous things of the king's person and family, which, unless you can justify yourself, will hardly be forgiven or forgotten; for such personal offences make deeper impressions than public actions, either of war or treaty.'

The reports were probably not to be gainsayed. Indeed

Sidney, in his answer to his father, says, 'That which I am reported to have written in the book at Copenhagen is true; and, never having heard that any sort of men were so worthily the objects of enmity as those I mentioned, I did never in the least scruple avowing myself to be an enemy unto them.' Accordingly, instead of coming home, he proceeded first to Hamburg, whence he went to Frankfort, and from thence to Rome, where he proposed to take up his residence. About the middle of the year 1661, however, he was forced to remove to Frascati; and he is afterwards traced to various places in Germany, France, and the Low Countries. In 1665 he was at the Hague, actively employed, along with other English exiles of the same principles, in urging the states of Holland to invade this country; and the next year he is found at Paris, impressing upon Louis XIV. the advantage France would derive from the establishment of a republic in England: a project in favour of which he engaged, in a memorial to the king, to procure a rising, if he were allowed a grant of 100,000 crowns. From this time he appears to have resided in Gascony, till at last, in 1677, a pardon and permission for him to return home were obtained from Charles II., on the plea that he was anxiously desirous to see his aged father once more before he died. The Earl died that same year, and, although he had never approved of the course his son had taken, left him a legacy of 5100*l.*, with which, he says, in his 'Apology,' dated on the day of his death, he would have immediately returned to Gascony, if he had not been detained by a long and tedious suit in Chancery, in which he was involved by his elder brother, now earl of Leicester, choosing to dispute his father's will. Before this, Sidney appears to have been only assisted by his father with irregular and scanty remittances; and during his wanderings on the Continent he was often in great straits.

It is commonly stated that Sidney's pardon was obtained through the interest of the earl of Sunderland, who was the son of his sister Dorothy (Waller's 'Sacharissa'); but he himself, in a letter to the Hon. Henry Savile, then the English ambassador at the court of France, appears to attribute it to that gentleman's exertions. 'My obligation unto you,' he says, 'I so far acknowledge . . . to be the greatest that I have in a long time received from any man, as not to value the leave you have obtained for me to return into my country, after so long an absence, at a lower rate than the saving of my life.'

We are indebted for the strongest light that has been cast upon the conduct of Sidney after his return, to the despatches of the French minister Barillon, published from the originals, in the foreign office at Versailles, by Sir John Dalrymple, in his 'Memoirs of Great Britain and Ireland,' 4to. Lond., 1773. In a despatch dated 5th Dec. 1680, Barillon writes, 'The Sieur Algernoon Sydney is a man of great views and very high designs, which tend to the establishment of a republic. He is in the party of the Independents and other sectaries; and this party were masters during the last troubles. They are not at present very powerful in parliament, but they are strong in London; and it is through the intrigues of the Sieur Algernoon Sidney that one of the two sheriffs, named Bethal, has been elected. The duke of Buckingham is of the same party, and believes himself at the head, &c. . . . The service which I may draw from Mr. Sidney does not appear, for his connections are with obscure and concealed persons; but he is intimate with the Sieur Jones [Sir William Jones, lately attorney-general], who is a man of the greatest knowledge in the laws of England, and will be chancellor, if the party opposed to the court shall gain the superiority, and the earl of Shaftesbury be contented with any other employment.' And in the account of his disbursements among the patriots, from the 22nd December, 1678, to the 14th December, 1679, Barillon sets down 'To Mr. Sidney 500 guineas, which makes 543*l.* 15*s.* sterling.' See also the despatch of Sept. 30th, 1680, for an account of the arguments Sidney was accustomed to use with Barillon to show that it was for the interest of France that England should be converted into a republic. Mr. Hallam has some remarks which will be found worth attention upon the conduct imputed to Sidney as to this matter, in his 'Constitutional History,' ii. 274 (4to. edition of 1827).

Sydney was a candidate for the representation of Guildford, at the general election in 1678, and for Bramber at that in 1679; but was defeated both times, although on the first occasion he petitioned against the return of his opponent, and on the second he was only unseated after a double return. He had thus openly taken his stand as the opponent of the court; and he was looked upon as leagued with Monmouth, Shaftesbury, Russell, Essex, and the other popular leaders, who may have differed among themselves in their principles and views, but the designs of the most moderate of whom certainly extended to such a change of government as would have amounted to a revolution. When the Rye-House Plot was announced [RUSSELL, WILLIAM, LORD], in June 1683, Sidney was immediately arrested, along with his friend Lord Russell, and committed to the Tower on a charge of high treason. He was brought up to the bar of the King's Bench to plead, on the 7th of November, and his trial took place on the 21st, before Sir George Jefferies, lately promoted to the place of Lord Chief Justice. Jefferies exhibited little of his wonted coarseness and passion on this occasion; but his demeanour was very determined and inflexible, and he bore down every objection of the prisoner with an authority that nothing could shake or impress. The only evidence in support of the principal facts charged was Lord Howard of Escrick, who had, according to his own account, been a party to the plot, and now came to swear away the lives of his associates in order to save his own; and as the law of high treason required two witnesses to prove the crime, the other was supplied by bringing forward a manuscript found among Sidney's papers, and asserted, no doubt with truth, to be his handwriting, which, it was pretended, contained an avowal and defence of principles the same, or of the same nature, with those involved in the alleged plot. He was found guilty; and being again brought up on the 26th, was sentenced to be put to death after the manner of execution then enjoined by law in cases of high treason. He twice petitioned the king for pardon; but all that could be obtained for him was the remission of the degrading and brutal parts of his sentence; and on Friday, the 7th of December, he was beheaded on Tower Hill. No one ever suffered with more firmness or with less parade. He did not even address the people; but when asked to speak, replied that he had made his peace with God, and had nothing to say to man. A paper which he delivered to the sheriff, and which was afterwards printed, concluded as follows:—'The Lord sanctify these my sufferings unto me; and though I fall as a sacrifice unto idols, suffer not idolatry to be established in this land. . . . Grant that I may die glorifying thee for all thy mercies, and that at the last thou hast permitted me to be singled out as a witness of thy truth, and, even by the confession of my very opposers, for that old cause, in which I was from my youth engaged, and for which thou hast often and wonderfully declared thyself.'

The trial and condemnation of Algernon Sidney seem to have shocked the public feeling of the time in no ordinary degree. Even the cautious Evelyn, after stating that he was executed 'on the single witness of that monster of a man, Lord Howard of Escrick, and some sheets of paper taken in Mr. Sidney's study, pretended to be written by him, but not fully proved, nor the time when, but appearing to have been written before his majesty's restoration, and then pardoned by the Act of Oblivion,' adds, that 'though Mr. Sidney was known to be a person obstinately averse to government by a monarch (the subject of the paper was in answer to one of Sir E. [R.?] Filmer), yet it was thought he had very hard measure.' He describes Sidney as 'a man of great courage, great sense, great parts, which he showed both at his trial and death;' and he appears to have been looked upon universally in the same light—by his friends as one of the ablest, by his enemies as one of the most dangerous of his party. While he was yet in exile, Charles himself, in 1670, described him to Colbert, the French minister, as one who could not be too far from England, where his pernicious sentiments, supported with so great parts and courage, might do much hurt. Indeed, with the exception of Shaftesbury, he was the only person of eminent ability in the particular knot of patriots to which he belonged. Yet he must not be confounded in intellectual, any more than in moral character, with that brilliant and versatile politician. A man of talent and accomplishments he was, but narrow minded, opinionative, and egotistical, to the point of utter impracticability. Burnet describes him 'as a man of most extraordinary courage, a steady man, even to obstinacy, sincere, but of a rough and boisterous temper, that could not bear contradiction, but would give foul language upon it.' 'He seemed to be a Christian,' adds the bishop, 'but in a particular form of his own: he thought it was to be like a divine philosophy in the mind; but he was against all public worship, and everything that looked like a church. He was stiff to all republican principles, and such an enemy to everything that looked like monarchy, that he set himself in a high opposition against Cromwell when he was made Protector. He had studied the history of government in all its branches beyond any man I ever knew.'

Sidney's 'Discourses concerning Government' were first published in 1698, with a short preface by John Toland; again in 1704, and a third time in 1751, at the expense of Mr. Thomas Hollis, who prefixed a Life of the Author, and also printed for the first time his 'Apology' already mentioned. This edition of the works of Algernon Sidney was reproduced in 1772 by Mr. Brand Hollis, to whom Mr. Thomas Hollis left his property, with notes and corrections by Mr. J. Robertson, and the addition of some letters and other short pieces of Sidney's, all previously published, together with a tract entitled 'A General View of Government in Europe,' first printed in James Ralph's anonymous publication entitled 'Of the Use and Abuse of Parliaments,' 2 vols. 8vo., Lond., 1744, and there attributed to Sidney, but which Robertson says he is convinced 'is the production of a different hand.' In fact there is no doubt that it is spurious. The two editions of 1751 and 1772 both contain 'Letters of the Honourable Algernon Sydney to the Honourable Henry Savile, Ambassador in France, in the year 1679, &c., now first printed from the Originals in Mr. Sidney's own Hand,' which originally appeared in an octavo volume at London in 1742. See also Arthur Collins's 'Memoirs of the Lives and Actions of the Sydneys,' prefixed to his 'Letters and Memorials of State,' &c., 2 vols. fol., London, 1746; and Blencowe's 'Sidney Papers,' 8vo., London, 1825. Collins states that several treatises by Sidney in Latin and Italian, and also an 'Essay on Virtuous Love,' in English, remain in his own handwriting at Penshurst. There is a Life of Algernon Sydney, by George Wilson Meadley, 8vo., Lond., 1813.

Sidney's trial was printed in 1684, but is said to have first passed through the hands of Jefferies, who struck out whatever he pleased. It is given, along with the other trials connected with the Rye-house Plot, in Howel's 'State Trials,' vol. ix., pp. 357-1000. See also the 'True Account and Declaration of the Horrid Conspiracy against the late King,' &c., written by Bishop Sprat, and published by order of James II. in 1685; and 'The Secret History of the Rye-house Plot, by Ford, lord Grey,' first printed in 1754.

The attainder of Algernon Sydney was reversed after the Revolution by the 7th Private Act of the first session of the first parliament of William and Mary, the preamble of which declared that Sidney had been most unjustly and wrongfully convicted and attainted 'by means of an illegal return of jurors, and by denial of his lawful challenges to divers of them for want of freehold, and without sufficient legal evidence of any treasons committed by him; there being at that time produced a paper found in the closet of the said Algernon, supposed to be his handwriting, which was not proved by the testimony of any one witness to be written by him, but the jury was directed to believe it by comparing it with other papers of the said Algernon; besides that paper so produced, there was but one witness to prove any matter against the said Algernon; and by a partial and unjust construction of the statute declaring what was his treason.' It is observable, that neither in this Act nor in that passed in the same session reversing the attainder of Lord Russell is there any assertion of the innocence of the convicted party. And Mr. Hallam observes (*Constitutional History*, ii. 329) that the common accusation against the court in Sidney's trial, 'of having admitted insufficient proof by the mere comparison of handwriting, though alledged not only in most of our historians, but in the act of parliament reversing Sidney's attainder, does not appear to be well-founded: the testimony to that fact, unless the printed trial is extraordinarily falsified, being such as would be received at present.'

SIDNEY-SUSSEX COLLEGE, Cambridge, was founded in 1596, on the site of a monastery of Grey Friars, pursuant to the will of Frances Sidney, countess of Sussex, who died in 1589. It was intended to support a master, ten fellows, and twenty scholars; but the estates being found inadequate, after defraying the building expenses, the number of fellows was reduced by the executors to seven. Two were however afterwards added by Sir John Hart, citizen of London. Besides these nine foundation fellowships (which are open to the natives of any part of her Majesty's dominions), two were founded by Mr. Peter Blundell, for the benefit of his scholars in this college; and one by Mr. Leonard Smith, the nomination to which is vested in the Fishmongers' Company of London. The Blundell fellowships are tenable for only ten years after the degree of M.A., and the Smith fellowship for only six. A mathematical lectureship, of the present value of 140*l.* per annum, was founded by Mr. Dudley Taylor; it is not tenable with a fellowship, but may be held by a layman. As this is a divinity college, all the fellows are obliged to take orders within three years after their election, and the degree of B.D. at the regular time prescribed by the University statutes. The college has 20 foundation scholarships, perfectly open, value 7*s.* per week during residence. Two other scholarships were founded by Mr. Blundell, and appropriated to scholars from Tiverton school. Archdeacon Johnson left two exhibitions, now 20*l.* per annum each, with preference to those educated at the schools of Oakham or Uppingham, in Rutland. Mr. Lovett founded two (now 45*l.* each per annum) for clergymen's sons, with a preference to those who have been three years at Grantham or Oakham school: there are also two by Mr. Bearcroft for clergymen's sons, now worth 12*l.* per annum each. The College has also two exhibitions of 12*l.* each, from the Haberdashers' Company; and one of 6*l.* from the Fishmongers' Company. Six mathematical exhibitions have been lately established on the foundation of Mr. Taylor; the yearly value of each is at least 50*l.*, with rooms rent-free. These exhibitions, as they become vacant, are given to those undergraduates of the College who distinguish themselves in mathematics at the Midsummer examination. There are various annual prizes (the highest 10*l.*) enumerated in the University Calendar. There are six church livings in the gift of the College. The visitor is Sir John Shelley Sidney, Bart., as the representative of the foundress.

Among the eminent men who have been members of Sidney-Sussex College, may be named Oliver Cromwell, Archbishop Bramhall, Bishops Seth Ward, Reynolds, and Wilson (Sodor and Man), Lord Chief Baron Atkyns, Sir Roger L'Estrange, Dr. Comber, Thomas Woolston, William Wollaston, &c.

The College is situated on the east side of Bridge Street. It is entered by a neat portico, and consists of two courts built of brick, and completed in 1598. The chapel and library were rebuilt in 1780.

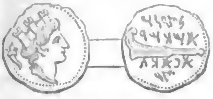
In 1840, Sidney-Sussex College had 92 members on the boards. (Dyer's *Hist. of the University of Cambridge*, Lysons' *Magna Britannia*, 'Cambridgeshire;' *Cambridge University Calendar* for 1840.)

SIDON, or ZIDON (צִידוֹן, Σιδών), the most ancient and for a long time the chief city of PHŒNICIA, and probably the mother city of Tyre, which is called in the Bible 'the daughter of Sidon' (*Is.*, xxiii. 12), and of the other towns on the Phœnician coast (*Gen.*, x. 15, 18; *Ptol.*, v. 15; *Mela*, i. 12). It lay on the coast of the Mediterranean, in a plain about a mile broad, 200 stadia from Tyre, 400 from Berytus, a day's journey from Paneas, and 66 miles from Damascus (Strabo, 756; Joseph., *Antiq.*, v. 3, 1; Abulfeda). It possessed a good harbour (Strabo; Joseph. *Ant.*, xiv. 10, 6; *Acts*, xxvii. 3), and at a very early period became a great maritime and commercial city (Diod. Sic. xvi. 41, 45; *Is.*, xxiii. 2; *Ezek.*, xxvii. 8). As early as the time of Joshua (B.C. 1444) it is called 'Great Zidon' (*Josh.*, xi. 8; xix. 28). The Sidonians are thought to have been the first manufacturers of glass (Plin., v. 17), and their skill in arts and manufactures is frequently referred to by Homer, as well as by later writers (*Il.*, vi. 289; xxiii. 743; *Od.*, xv. 415; xvii. 424; Virg., *Aen.* iv. 75; Strabo, xvi. 757; Plin., xxxvi. 66; Dion. Perieg., 913). They are often mentioned in the Bible as skilful builders (1 *Kings*, v. 6; 1 *Chron.*, xxii. 4; *Ezra*, iii. 7). They were worshippers of the goddess Ashtoreth, whose head is commonly found upon their coins.

At the division of Canaan among the tribes of Israel, Sidon, with the adjacent country, fell to the lot of Asher, who were never able to conquer it. Indeed the Sidonians are mentioned among the nations which successively ruled over Israel in the time of the Judges (*Judges*, x. 12); but generally the Israelites and Phœnicians seem to have been on terms of close friendship. The importance of Sidon was gradually eclipsed by that of Tyre, which then became the chief city of Phœnicia. In the time of David and Solomon

Sidon appears to have been under the dominion of the king of Tyre (2 *Sam.*, v. 11; 1 *Kings*, v.). It still however continued to be a place of great importance. Its position placed it at the mercy of every invader. When the Assyrian conqueror Shalmanezer invaded Syria, Sidon separated itself from Tyre, and surrendered to him (Joseph., *Antiq.*, ix. 14, 2). It had a king of its own under the Assyrians and also under the Babylonians and Persians, to whom it became successively subject. The Sidonians furnished the best ships in the fleet which Xerxes collected for the invasion of Greece (Herod., vii. 96, 99, 100); and the king of Sidon is mentioned as receiving from Xerxes the first seat of honour among the kings and commanders at the conference which preceded the battle of Salamis; and next to him on that occasion sat the king of Tyre (Herod., viii. 67). Under Artaxerxes Ochus the Sidonians revolted, together with the other Phœnicians and the Cyprians. After a short siege Sidon was betrayed to Ochus by its king Tennes, upon which the Sidonians burnt themselves with their city and treasures (Diod. Sic., xvi. 41-45). The city was rebuilt. It submitted to Alexander the Great without resistance. After his death it was subject alternately to the kings of Egypt and Syria, till it fell under the power of the Romans. It is now called Saida, and still has a considerable commerce, and about 8000 or 9000 inhabitants. It suffered a bombardment during the recent operations on the coast of Syria, by the allied fleets of England, Austria, and Turkey, against Mohammed Ali (1840).

(Winer's *Biblisches Realwörterbuch;* Calmet's *Dictionary; Pictorial Bible*, Note on *Josh.* xix. 28; Georgii's *Alte Geographie.*)



Coin of Sidon.
The inscription is in the old Phœnician character.

SIDO'NIUS APOLLINA'RIS, a Latin writer, or with his full name, C. SOLLIUS APOLLINARIS MODESTUS SIDONIUS, was born in the province of Gallia Lugdunensis, A.D. 428. His works consist of several poems, chiefly panegyrics and epithalamia, and nine books of epistles, which possess some historical value; but the style and language of his prose, as well as poetry, bear evident traces of the downfall of the Latin language and literature. Sidonius was a person of high rank. He lived, as appears from his epistles, on intimate terms with Theodoric, king of the Visigoths. He was the son-in-law of the emperor Avitus, whom he praises in a panegyric of 600 verses, for which he was rewarded with a bronze statue placed in one of the porticoes belonging to Trajan's library; and on the inauguration of the emperor Anthemius at Rome, he obtained the office of præfect of the city, as a reward for the panegyric which he pronounced upon the occasion. Sidonius was made bishop of Arverni (Clermont) in A.D. 473, and died in 484.

The first edition of Sidonius was printed at Lyon in 1552. The best editions are by Sirmondus, Paris, 1614, 4to., and Labbeus, Paris, 1652, 4to. (Germain, *Essai Littéraire et Historique sur Apollinaris Sidonius*, Montpellier, 1840, 8vo.)

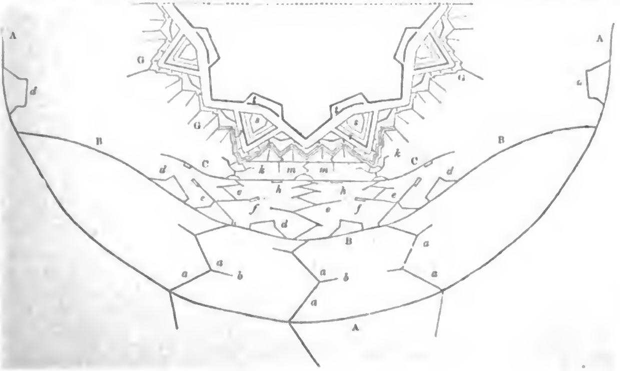
SIEBENKEES, J. P. [STRABO.]

SIEGE is the process of advancing towards a fortress under the cover of earth thrown up from trenches excavated in the ground; silencing its fire by a superior fire of artillery and musketry; and finally, by breaching the ramparts, either obliging the defenders to surrender, or forcing an entrance into the place.

A fortress is invested previously to the commencement of the siege by posting troops about it, so as suddenly to occupy all the avenues to the place, and prevent the garrison from receiving succours. The besieging army, on its arrival, establishes itself in the environs of the place at a distance equal to about two miles, so that it may not be annoyed by the fire of the artillery of the defenders; protecting itself generally by redoubts raised at intervals, both on the side nearest to the fortress, and on that which is towards the country. [COUNTERVALLATION.]

The operations of a regular siege, when conducted against places fortified according to any of the modern systems, are nearly the same till the approaches (the oblique lines of trenches) arrive at the foot of the glacis; and when, as in the first system of Vauban, the flanked, or most advanced, angles of the bastions and ravelins are nearly at equal distances from the centre of the place, those approaches may be directed along the produced capitals (lines imagined to bisect the angles) of a ravelin, and of the nearest bastion on each side of it; since then, when the glacis before those works is crowned by batteries, the rampart of the enceinte may be breached in two places at once. But in systems which, like that of Cormontaingne, have great ravelins, the approaches should be directed along the produced capitals of a bastion, and of the nearest ravelin on each side, because the glacis of the bastion cannot be crowned till the two collateral ravelins are taken; and if the lines of approach were directed as in the former case, it would be necessary to take three ravelins before either bastion could be breached. The lines of approach are carried on nearly in the direction of the produced capitals of the bastions and ravelins, because there the ground is less subject to the direct fires from the fortress.

In commencing operations, the engineers, having ascertained on the ground the prolongations of those capitals, trace, by means of pickets driven in the ground and connected by tapes, the direction of the first parallel trench, A A A, which is generally everywhere about 600 yards from the advanced parts, G G G, of the covered-way. This pa-



rallel usually extends along the fronts attacked, and so far beyond as to embrace the prolongations of all the ramparts, a fire from which might be directed against the works of the besiegers: it should terminate at each extremity, if possible, in some natural obstacle, as a morass or a river; and if no such obstacle exists, a redoubt may be raised there, in order, by its fire, to oppose any attempt of the enemy to turn the parallel. The trench is executed by numerous working-parties of men, who, being provided with spades and pick-axes, are marched up to the ground after sunset, and are disposed along the line at intervals of four feet from each other. The earth obtained from the trench is thrown towards the fortress, in order to form a breastwork; and in the morning the men are relieved by others, who complete the parallel where it may have been left unfinished, and dig trenches obliquely towards the rear, for the purpose of having secure communications to and from the depôts of materials. All the trenches are sunk three feet below the surface of the ground; and the earth thrown out forming a mass about three feet high, the troops in them are effectually covered from the view of the besieged. The general breadth is 10 or 12 feet, but greater width is given in places at intervals from each other.

The first operations of the working-parties take place during the night, in order that some progress may be made before they are discovered by the defenders; but should the latter suspect that the ground is being broken, they frequently discharge fire-balls, by the light of which they may discover the places where the men are at work. These places being ascertained, it may be expected that the ground will be cannonaded, or that troops will make a sortie from the fortress, for the purpose of interrupting or driving off the workmen; and in order that this intention may be frustrated, the parties are accompanied by a guard of infantry, which is placed at about 50 yards in front of the tracing-line. These troops obtain cover if possible, or lie down on the ground, that they may not be exposed to the defenders' fire; and in the event of a sortie being made, they are to repel it by force: squadrons of cavalry are also stationed near the extremity of the parallel, that by a rapid movement they may cut off the retreat of the sortie.

The general uses of the parallel trenches are to connect the lines of approach by a covered line of communication, to allow the trenches to be kept clear of troops and free for the workmen, and to serve as lines of countervallation in confining the garrison of the place. As soon as the first parallel is finished, the guard of the trenches is moved into it, for the purpose of protecting the succeeding operations.

Since the trenches leading from the first parallel towards the place ought not to be enfiladed from thence, it is evident that they must be formed in zig-zag or oblique directions, *a a a*, &c., crossing and recrossing the produced capitals of the bastions or ravelins; and that the several branches, if produced, should fall on the exterior of all the works of the place. The first oblique *boyeau* (branch) of the trench may be defended by the fire of the parallel; but the second, being beyond the effective range of musketry from thence, is to be protected by the fire of troops stationed in a small trench, *a b*, called a parallel boyeau, at the angle between the first and second branches; and a short branch for the like purpose is generally formed, when necessary, at the angles of all the zig-zag trenches. If the directions of the several oblique branches are not laid down on the ground, from a plan of the intended operations previously made on paper, the engineer endeavours, during the daylight, to observe, in the direction of the most advanced part of the glacis towards his right or left hand, some object towards which the tracing-line may be stretched and the trench carried on. These trenches are then executed by the working-parties, in the same manner as the great parallel was formed. At the siege of Badajos, in 1812, a French corporal, in the dusk of an evening, dexterously displaced a tracing-line which had been stretched by the British engineers, and directed it so that the trench executed along it might have been enfiladed by three guns on the ramparts of the castle. If the derangement had not been discovered before darkness came on, the labour of the whole night would have been lost, and casualties might have occurred from the fire which the garrison might have directed along the trench. The workmen are usually relieved after it is dark, in order that the change may not be observed from the fortress; but the officers should be relieved earlier, that those who come on duty may have light enough to examine the actual state of the works, and to take measures for directing the operations of the men during the night.

When the heads of the trenches have arrived within 300 yards of the covered-way, which is usually about the fourth night from the time of opening the trenches, a second parallel trench, B B B, is formed, in order to facilitate the communication between the several lines of approach. This trench may be extended along the particular points attacked, and its extremities may be terminated by redoubts, or continued till they fall into the first parallel. It is executed by flying sap [Sap], that the men may be quickly protected from the fire of musketry in the covered-way, which might now begin to take effect. One of the principal means of accelerating the surrender of the fortress is that of enfilading the ramparts, in order to dismount the guns and drive the defenders from the parapets: for these purposes batteries, *d d d*, &c., are raised in the directions of the produced faces of the works, and in or near the first or second parallel, which thus may form a secure communication between them. [Battery; Ricochet.] From the same batteries also an oblique fire may sometimes be directed against the interior of the flanks and curtains, and a plunging fire into the ditches, in order to impede the communication between the place and the outworks. All the different ricochet batteries commence firing at the same time, that the attention of the defenders may be divided, and that they may be prevented from concentrating all their fire upon one battery; the guns also should be fired singly, and at intervals so regulated that there may be always some shot or shells in the air, for thus the enemy will have little time to repair the damage done to his artillery or to the parapets. The firing should be commenced during daylight, in order that the artillerymen may be able to determine by trial the charge of powder and the degree of elevation for each piece, so that the shot may just clear the parapet of the work to be enfiladed; this being obtained, the direction of the piece may be preserved by means of timbers nailed to the platform, and thus the fire may be kept up with equal accuracy by night and by day.

After the fire from the ricochet batteries has partly silenced that of the place, the trenches of communication are continued in zig-zag directions as before, and with the like precautions against being enfiladed from the fortress and its covered-way. These and all the succeeding trenches may be executed by full sap [Sap], while the fire of the besieged continues in activity; but if that fire should become at any time relaxed, the opportunity may be seized of carrying on some part of the approaches in a more expeditious manner. When the heads of the oblique trenches are about half-way between the second parallel and the foot of the glacis, a semi-parallel, *e e*, &c., is carried out on each side of the produced capitals of the works attacked, till it meets the prolongation of the crest of the covered-way: its use is to protect the works which are to be executed in its front by a fire of musketry, which, being nearer, is more effectual than that of the second parallel. Howitzer batteries, *f f*, &c., are formed at the extremities of these parallels for the purpose of enfilading the covered-way with shells, and thus destroying the palisades and traverses: their interiors are sunk below the level of the ground, in order that their epaulemens may not mask the fires from the ricocheting batteries in their rear. As soon as the fires from the howitzers have produced some effect, the oblique trenches may be continued till they arrive at the foot of the glacis, on the capital of each of the works attacked, the branches being directed, as before, towards the exterior of any part of the covered-way from whence the enemy might enfilade them; and each being prolonged towards the rear about 10 or 12 yards, in order to form places where tools and materials may be deposited out of the line of passage along the trenches. If the defenders should have established redans or redoubts at the foot of the glacis, or should have carried out counter-approaches from any of the collateral works, in order to enfilade the trenches of attack, they must be assaulted and destroyed as soon as it is found that the fire from thence impedes the operations of the besiegers.

A third parallel trench C C may now be executed to connect the points of attack at the foot of the glacis; for this purpose the squads of sappers turn to the right and left from the head of each line of approach, and meet each other, forming as they proceed a trench which is either rectilinear or curved towards the re-entering parts of the fortress, in order to enable the troops in it to fire less obliquely on the branches of the covered-way. This parallel should be made broader than the others, because considerable bodies of troops are occasionally collected in it, and at intervals steps should be made in it long enough to allow a company of men to mount in line over the parapet. For the protection of the troops, the crest of its parapet should be furnished with sand-bags disposed so as to leave between them small intervals (loop-holes) to fire through; and in this parallel, batteries, *h h*, &c., for small mortars may be formed, in order that shells may be thrown from thence into the principal works. It is estimated that the third parallel may be finished by about the tenth night from the time of opening the trenches.

At this period, should any great necessity exist for hastening the surrender of the place, should also the garrison be weak, and should there be no retrenchments in the covered-way, it may be thought proper by main force to assault the latter, and immediately crown the glacis with batteries for breaching the works. In this case, the defenders should be driven as much as possible from the covered-way by a heavy fire from the mortar and howitzer batteries; then the troops who are to make the assault, having been assembled in the third parallel, mount, at a signal a little before sun-set, over its parapet, and proceed rapidly up the glacis. A party of men then extend themselves along its crest, and by their fire keep down that of the defenders on the parapets; in the meantime the sappers commence forming with gabions a lodgment on the crest, and the rest of the storming party endeavour to force an entrance through breaches made by artillery in the palisades. When the defenders have thus been compelled to retire behind the traverses in the covered-way, the assailants, who then become exposed to the fire from the parapets of the bastions or ravelins, retire into the lodgment which by this time may be finished on the crest of the glacis; and during the night there may be executed trenches of communication from the lodgments to the third parallel. The lodgments thus formed may be afterwards connected together, and extended to the right and left if necessary; and in these the breaching batteries may be formed.

Should the fortress have small ravelins, like those of Vauban, the assault may take place at once on the salients of a ravelin and of the two collateral bastions; but if the ravelins advance far towards the country, as in the method of Cormontaingne, it can take place only at the salients of the ravelin on each side of one bastion; since if it were attempted to carry on the approaches between the two ravelins, the troops and sappers would become exposed to fires on their flanks and in rear as well as in front.

An assault by main force is always attended with considerable loss, and therefore, if time permits, it is preferred to continue carrying on the approaches by sap. For this purpose, supposing the place to be fortified with large ravelins (as in the cut), a trench is begun at about thirty yards on each side of the ridge between the two faces of the glacis before the ravelins only, and carried in a curvilinear direction till the two squads of sappers meet on the ridge about eight or nine yards in advance of the third parallel. From hence the trench is continued by double and direct sap along the ridge till it arrives at between thirty and forty yards from the crest at the angle of the glacis; and at this spot, formerly, high breastworks, called trench cavaliers, *k k*, &c., about the thirteenth night from the time of opening the trenches, were raised on the prolongations of the branches of the covered-way, in order to allow a plunging fire of musketry to be directed into those branches. But as the fire of the defenders' artillery may prevent the construction of such works, instead of them there are now formed batteries armed with small mortars from which balls or stones may be projected into the covered-way in order to compel the defenders to retire from thence. (Mortars for throwing stones are called by the French engineers *pierriers*.)

After the fire from the cavaliers or mortar-batteries has obliged the enemy to abandon the advanced parts of the covered-way, double saps are carried on towards the salient angle of the glacis, and when they have arrived at about twenty-four feet from that angle, the crowning of the glacis commences. This is performed by extending the sap along the crest on each side of the angle, and throwing up the earth towards the place in order to form epaulemens for batteries. That the crowning trenches may be secured against the enfilading fires from the collateral works of the besieged, traverses are formed across them at intervals in situations where they may not interfere with the guns to be placed in the batteries; and, on account of the fire which the enemy may still keep up from the branches of the covered-way and the retrenchments in the re-entering places of arms (see the figure in art. FORTIFICATION), a portion of a fourth parallel, *m m*, should now be carried out in order that troops placed there may protect the sappers during the formation of the batteries, and the artillerymen during the operation of breaching the ravelins. The crowning of the glacis is sometimes extended along the faces of the re-entering places of arms; and in this case the trenches on those faces are connected with the fourth parallel by lines of communication formed in serpentine directions.

The epaulemens raised by the besiegers between the salient angle of the glacis and the first traverses on each side are to serve as counter-batteries, whose use is to ruin the parapet and dismount the guns in the faces or flanks of the collateral works, in order as much as possible to prevent the enemy from opposing by musketry or artillery the passage which is to be effected across the ditch; and the epaulemens between the first traverses and the re-entering places of arms serve for the breaching batteries. [BREACH.] The crowning batteries on the glacis of the two ravelins *r r* are supposed to be finished about the sixteenth night from the time of opening the trenches.

While the breaches are being formed, the passages by which the descents into the ditches of the ravelins are to take place are commenced. These are either open trenches or subterranean galleries cut in inclined planes through or under the covered-way opposite the breaches; each passage thus terminates at a perforation in the counterscarp about three feet above the bottom of the ditch if dry, or at the level of the water if it contain any. The sappers throw fascines into the ditch if dry, till the heap is sufficiently high and thick to secure them from the fire of the defenders, and then getting in, they form by sap a trench and parapet extending some way up the breach itself. Preparations are afterwards made for the assault.

For this purpose the interiors of the batteries and the passages leading to the ditches are during the night filled with troops, in whose rear are bodies of sappers with their materials; and early in the morning, after a heavy fire has been for some time kept up from the batteries in order to drive off the defenders, the troops charge up, and endeavour to keep the enemy engaged while the sappers execute lodgments on the breaches by filling their gabions with the loose earth; as soon as these are finished, the storming parties retire behind them, and from thence keep up a fire upon the enemy. These lodgments should if possible be on the tops of the breaches, but if the interior of the ravelin is retrenched by a reduit, as *s s*, whose fire commands those spots, the lodgments must be formed on the ascent, that they may not be immediately destroyed. It is estimated that the two ravelins may be taken about the eighteenth night.

If the ditches contain water which cannot be made to flow off, there may be formed across them solid causeways consisting of fascines laden with stones to make them sink, or of casks or gabions having their axes in horizontal positions; or floating-bridges of timber-logs, casks, or pontoons may be constructed; and by any of these means the troops may pass over to the assault. From the lodgements just mentioned trenches are carried on by sap directly to the top of the breach, and from thence turning to the right and left they are continued about half-way down the faces of the ravelins: their extremities being made to join the parapets of those works.

The reduits in the two ravelins are next to be taken; and to effect this object, it being supposed that the faces of the ravelins are too narrow to allow room for forming batteries on them, either a portion of the ravelin must be blown up in order to allow the fire of the breaching-batteries on the glacis to act against the reduits through the apertures, or else the reduits must be breached by undermining them. Should the latter method be preferred, a trench or gallery is cut through the mass of each ravelin, and a sap is carried across the ditch of the reduit; the miner then, being secured against the effect of the enemy's grenades by timbers placed in inclined positions leaning against the scarp of the reduit, cuts through that scarp and forms chambers for the reception of gunpowder. This being fired, a part of the rampart will be destroyed and a breach formed. An assault is then made by troops, and the defenders being supposed to be driven out of the works, a battery may be raised along the gorge of each reduit in order to compel them to quit the tenailles, *t t*, in the main ditch. The reduits of the ravelins being taken (probably about the twenty-first night), the defenders will also be obliged to retire from the rear extremities of the latter works; and the besiegers occupying those extremities, their fire from thence commanding the interiors of the reduits in the re-entering places of arms, these last must also be abandoned.

The approaches towards the bastions may now be recommenced, as the fires from the ravelins are no longer to be apprehended; therefore a double sap is carried on from the curved trench in the third parallel directly along the ridge of the glacis, till it begins to be plunged into by the fire from the bastion; it then proceeds in a serpentine direction till its head arrives between the portions of the fourth parallel already formed. This parallel is then completed, and under the protection of the fire from the troops stationed in it, the counter and breaching batteries before the bastion are formed. By the former the fire from the guns in the flanks of the collateral bastions is partly silenced, and by the latter the breach in the faces of the opposite bastion is effected. The passage through the counterscarp and a trench across the main ditch are then executed, and an assault may be made up the breach of the bastion, similar to those which had been made up breaches of the ravelins; the defenders being repelled, a lodgment may be formed, and unless the bastion is strongly retrenched, it may be expected that the place will now be surrendered. It is estimated that the assault of the bastion may take place about the twenty-sixth night from the time of opening the trenches; but a good retrenchment [RETRENCHMENT] in a bastion may enable the defenders to hold out ten or twelve days longer.

A fortress is said to be countermined when subterraneous galleries are formed under the ramparts of the bastions and ravelins; under the covered-way, and under the ground at the foot of the glacis, with galleries of communication from one of these to another. And as the defenders can form chambers and place powder in or near any convenient parts of these galleries to destroy the works of the besiegers above-ground, the besiegers find themselves under the necessity of sinking shafts and forming galleries for the purpose of finding out and destroying those of the defenders, or of blowing up any of their advanced works. [MINES, MILITARY.]

A siege conducted according to the rules of art will be attended with comparatively small loss to the besiegers or besieged, the troops of both parties being but little exposed to each other's fire except at the times when the assaults are made on the ravelins or bastions. And if circumstances, such as the prospect of the place being relieved, did not compel the besiegers to expedite the surrender, the assaults by main force might be avoided; for after a breach has been formed, and the parapets of the place have been in a great measure ruined by the artillery of the besiegers, a sapper might be sent across the ditch by night with instructions to commence a trench under cover of one extremity of the broken wall; then, if he succeed in getting cover for himself, others may follow, and gradually there may be formed on the breach a lodgment sufficiently large to contain troops, whose fire would protect the succeeding operations: it being understood that a firing party in the batteries on the glacis force the defenders to retire as often as they endeavour to disturb the sappers while at work.

The want of time and means to carry on the approaches as far as the covered-ways was the cause of the great losses sustained in getting possession of the fortresses garrisoned by the French in Spain during the Peninsular war. The breaches in the walls of Badajos (1812) were made by guns in batteries at the distance of 500 yards; and when the assailing troops had descended into the ditch, being ignorant of the positions of the breaches, and confused by the darkness of the night, which was relieved only by the appalling and destructive blaze of live shells and other combustibles thrown upon them from the parapets, they took a wrong direction, or remained patiently to be slaughtered till the order was given to retire. The effort would have entirely failed, but for the success of Major-General Picton in escalading the walls of the castle, and of General Walker in escalading the bastion of S. Vincente.

SIENA, *the Province of*, one of the great divisions of Tuscany, which till lately comprehended the whole southern part of that duchy, corresponding to the territory of the former republic of Siena, is bounded by Florence on the north, Pisa and the Mediterranean on the west, Arezzo on the east, and the Papal State on the south, from which it is partly divided by the river Fiora. The territory of Siena is now divided for administrative purposes into two provinces, styled Compartimento di Siena, and Compartimento di Grosseto. The Compartimento of Siena Proper comprehends the highlands, or northern and eastern parts of the country; that of Grosseto comprehends the western and southern lowlands, or the extensive maremma known geographically by the name of Maremma Sinese, to distinguish it from the Pisan Maremma. The province of Siena Proper lies in the upper basin of the Ombrone, and its affluents the Arbia, the Mersa, and the Orcia. The Ombrone, called Umbro Major by the Romans, to distinguish it from the Umbro Minor of Pistoia, is the largest river of Tuscany next to the Arno: it rises from a copious source near Cela Mura, or Civita Mura, in the Monti di Chianti, a Subapennine ridge which divides the valley of the Ombrone from that of the Upper Arno, and flows southwards by Berardenga and Asciano, skirting the western base of Monte San Savino, which divides it from the valley of the Chiana; it then passes by the town of Buonconvento, below which it receives the Arbia from the north, which passes near the city of Siena. The Ombrone then inclines to the south-west, flowing along the western base of the hills of Montalcino, and receives the river Mersa from the north-west, a tortuous stream which has a course of above fifty miles. It then flows direct south, through a narrow and deep defile between the hills of Montalcino on the east, and a hilly tract on the west that divides the waters of the Ombrone from those of the Bruna, which flows into the lake of Castiglione. Issuing from the narrow gorge beyond Monte Antico, the Ombrone receives from the eastward the Orcia, a mountain torrent which drains the northern side of the volcanic group of the mountains of Radicofani and Montamiata, and also the hilly region of Montepulciano. The Orcia has a course of about thirty miles. Passing by Paganico, the Ombrone forms a bend to the south-east, and passing through a low ridge, it enters the wide plain of the Maremma, through which it flows in a south-west direction, passing near Grosseto and the lake of Castiglione, into which part of its water is conducted by a canal lately constructed in order to fill up by its alluvium that pestilential swamp; the main body of the river enters the sea at Torre della Trappola, after a course of about eighty miles. The whole area of the basin of the Ombrone and its affluents is estimated at 2660 square miles, and it is the most extensive in Tuscany next to the basin of the Arno.

The compartimento or province of Siena Proper consists of highlands and valleys, being crossed by various ranges of hills, composed mostly of marls covered by yellow sand, and abounding with organic remains, which are called by Brocchi and other geologists 'Subapennine.' [APENNINES.] Few summits exceed one thousand feet, except the Montagna di Cetona, or Monte Pisi, on the borders of the Val di Chiana, which is above 2500 feet high; the volcanic cone of Radicofani, which is above 3000 feet; and the partly volcanic group of Montamiata, or Mount Santa Fiora, which rises to about 5000 feet above the sea.

The area of the province of Siena is reckoned at about 1250 square miles; and the population in 1836 was 139,650, distributed among thirty-four communes. (Repetti, *Dizionario Geografico della Toscana*, art. 'Gran Ducato.')

The following are the principal towns:—1, SIENA. 2, Montalcino, a walled town and bishop's see, situated on a lofty hill 20 miles south-east of Siena, and six miles out of the high road from Florence to Rome: it has a cathedral lately rebuilt, with a few good paintings; a clerical seminary; a convent of Austin friars; several other churches and convents; an hospital, and orphan asylum; a small theatre; some manufactories of coarse linen, hats, pottery, and leather; and about 3800 inhabitants. 3, Colle, in Val d'Elsa, on the slope of a hill near the sources of the river Elsa, an affluent of the Arno, twelve miles north-west of Siena, is a thriving town and a bishop's see, in a territory which produces abundance of wine, oil, and silk; it has a fine cathedral, several other churches, a large hospital, and other charitable institutions; a clerical seminary, three schools for boys, a conservatory for the education of young girls, several paper-mills, manufactories of woollens and hats, of glass, pottery, and leather; and about 2500 inhabitants. The smaller towns of the province are Pienza, Buonconvento, San Quirico, &c.

The compartimento or province of Grosseto comprehends the southern and lower part of the former territory of Siena, consisting chiefly of a vast tract of maremma along the coast of the Mediterranean from the valley of the Cornia on the borders of the province of Pisa, to the Lake of Burano and the river Fiora, which form the boundary of the Papal State, being a length of about 70 miles, whilst its breadth from the sea-coast inland is from 15 to 20 miles. [MAREMMA.] The surface of the province is 1893 square miles, with a population of about 72,000, exclusive of the island of Giglio, which lies off the coast and belongs to the province, and has an area of about eight or ten square miles, and a population of 1500 inhabitants. Besides the Ombrone, several rivers flow from the hills, which form a belt along the inland side of the Maremma, and crossing the plain, run into the sea after a short course. These streams are,—1, the Cornia, which after a course of 24 miles enters the lagoon of Piombino, which communicates with the sea; 2, the Pecora, a small river near Massa, which enters the lagoon of Scarlino; 3, the Bruna, already mentioned, enters the lake or lagoon of Castiglione, which likewise communicates with the sea; 4, the Albegna, which rises in the Monte Labro, a summit about 3600 feet high, forming part of the group of Montamiata, flows rapidly southwards, passing by the ruins of the Etruscan city of Saturnia, receives several mountain-torrents, and then crossing the Maremma enters the sea north of Mont Argentaro, after a course of 34 miles.

The Maremma of Siena is not a uniform level, for at several points, as at Campiglia, Massa, Magliano, and Capalbio, the hills approach near to the sea, dividing the maritime plain into several basins, distinguished by the names of Maremma of Massa, Maremma of Grosseto, &c. There is a succession of shallow lagoons along the sea-coast, which by their mephitic exhalations in summer occasion the malaria and the fevers resulting from it. The largest are the lagoon of Castiglione della Pescaia, and the lake of Orbetello, which is salt, and occupies an area of about ten square miles. Between the lake of Orbetello and the sea rises the rocky and lofty promontory of Monte Argentaro, a conspicuous object from the sea, which, like Monte Circello, on the coast of the Pomptine marshes, appears to have been once an island. Monte Argentaro is of calcareous formation; it occupies an area of about 22 miles in circumference, and the summit is about 1700 feet high. It is joined to the mainland by two very narrow and low isthmuses which run between the lake of Orbetello and the sea-coast, the northernmost of which is intersected by a narrow canal called Della Peschiera, which communicates between the lake and the sea. The sea at the base of Monte Argentaro is very deep, and forms two good harbours, Santo Stefano on the north and Port Ercole on the east, besides several other creeks with good anchorage. Port Ercole has a strong fort, and several towers defend the coast on the foot of the mount, which, owing to its situation, might be made a second Gibraltar. The mountain is covered with forests which abound in game: it has copious springs and excellent pastures, and the air is perfectly healthy.

The air of the Maremma is very unwholesome, and the towns situated in it, with the exception of Orbetello, are thinly inhabited, and subject to the malaria fever. The principal branch of industry is the rearing of cattle, which feed in the wide solitary plains, and the cutting of timber in the extensive forests. Corn is sown, but not to a great extent. The wine made in the Maremma is not in much esteem. However the great hydraulic works undertaken and partly effected by the present grand-duke Leopold II., which are designed to fill up the pestilential lagoons and marshes, have already produced a considerable improvement in the atmosphere of the Maremma. The lagoon of Castiglione, which in 1829 covered 33 square miles, has been reduced to about one-half the size; other lagoons have been entirely drained, and become cultivable land; the rivers have been embanked; a fine road has been opened along the length of the province, parallel to the line of the antient Via Aurelia; handsome bridges have been thrown across the rivers; Artesian wells have been made to provide the inhabitants of Grosseto and other places with wholesome water: and the consequence is that the population is increasing as the malaria decreases, fresh ground is broken up, and cultivation and life spread along the once desolate wastes.

The following are the towns of the province of Grosseto —1, Grosseto, the head town, built in the middle ages from the ruins of the Etruscan town of Rusellæ, which was a few miles distant, lies in the midst of a wide plain between the Ombrone, the lagoon of Castiglione, and the sea-coast, from which it is distant six miles, and about 45 miles south of Siena. Grosseto is surrounded by walls and bastions, and contains about 2400 inhabitants. About a century ago it contained only 700 inhabitants. It is a bishop's see, has a clerical seminary, an elementary-school and a grammar-school, and a civil and criminal tribunal for the whole province. Grosseto was subject to the republic of Siena till the fall of that state, when it came with it into the possession of the grand-dukes of Tuscany. 2, Massa Maritima, a bishop's see and a town with some fine buildings, is situated on a hill a few miles from the sea-coast, north-east of Piombino. The malaria had reduced its population in the last century to about 400 inhabitants, but the draining of the neighbouring lowlands and the fresh stimulus given to industry have effected considerable improvement, and it has now a population of nearly 3000. At Follonica, on the sea-coast, 10 miles south of Massa, are extensive furnaces and iron-works, in which the iron from the mines of Elba is smelted and cast or wrought. 3, Piombino is a small town on the sea-coast facing the island of Elba, from which it is divided by a channel about five miles wide. Piombino was a principality belonging to the family Ludovisi, from whom it was taken by Napoleon, and given to his brother-in-law Baciocchi. On the fall of Napoleon it was united with Tuscany, and the former prince received an indemnity. Piombino is fortified, has a small harbour, and about 1500 inhabitants. It lies about 40 miles south of Leghorn. The neighbouring lagoon is now in progress of being drained. 4, Campiglia, a thriving town in the valley of the Cornia, 10 miles north of Piombino, in a healthy situation on a hill, with a handsome church built in the twelfth century, an hospital, and a population of 2200. The surrounding territory is well cultivated, and produces corn, wine and oil, timber and potash. The inhabitants carry on some trade by sea by the neighbouring port of Baratti. The remains of the Etruscan town of Populonia are on the coast seven miles south-west of Campiglia. 5, Orbetello is a considerable town, built on a promontory which projects into the salt lake of the same name, which is situated at the inland base of Monte Argentaro. The walls of Orbetello are formed of large stones without cement, and the town is strongly fortified on the side of the isthmus which unites it and the mainland. It is supposed by some that the antient Subcosa stood on the spot where Orbetello is now, and many remains seem to confirm the supposition. Orbetello was until the beginning of the present century the capital of a small state, called 'Stato dei Presidj,' which embraced a tract of coast from Talamone on the north to the confines of the Papal State on the south, including Monte Argentaro, and also Porto Longone and the southern part of the island of Elba. This territory belonged for centuries to Spain, and was ceded in the last century to the king of the Two Sicilies; but by the last treaty of Vienna it has been annexed to Tuscany, of which it naturally forms a part. The town of Orbetello has about 3000 inhabitants, and enjoys a healthy climate, though the surrounding country is affected by the malaria. The lake abounds with fish. 6, Pitigliano, an inland town in a fine situation in the valley of the Fiora at the foot of the lofty group of Montamiata, near the borders of the Papal State, has about 2000 inhabitants. The Fiora, which has its source in the mountain of the same name, runs southwards, and after a course of about 30 miles in the Tuscan territory enters the Papal State, and passes near Montalto, after which it enters the sea.

The island of Giglio, the antient Igilium, which belongs to the province of Grosseto, is 11 miles west by south of Monte Argentaro: it has a harbour on its eastern coast, and a castle with a village on the hill above it. The surface is mountainous, and the rocks are of granitic formation, except in the western part, which is calcareous. Brocchi visited Giglio in 1818, and gave a geological account of the island in vol. xi. of the 'Biblioteca Italiana.' Professor Giulj afterwards visited Giglio, and his statistical account of the island is contained in the 79th vol. of the 'Biblioteca Italiana,' published in 1835. The inhabitants, both men and women, are very industrious, and cultivate corn and the vine. They export annually 12,000 barrels of wine to the Continent. They have a few sheep and pigs, and many goats and abundance of poultry. A number of them are fishermen and sailors. Almost all the families are possessed of some landed property. Beggars and robbers are unknown on the island. A considerable part of the island is covered with timber trees.

The neighbouring island of Gianutri is about five miles in circuit: it is destitute of springs, and uninhabited. Some Roman remains have been found upon it, which show that the island was once inhabited.

SIENA, *the City of*, one of the principal towns of Tuscany, is situated on a hill with a very uneven surface, surrounded by other hills belonging to the range which runs across the centre of Tuscany from north-east to south-west, and divides the waters that flow northwards into the Arno from those which run southwards into the Ombrone. The Arbia, an affluent of the latter, flows through a deep valley about four miles east of Siena. The air of Siena, on account of its elevation, is keen, and the winter rather severe. The town has the form of a polygon, and is about five miles in circumference. It is 24 miles south of Florence, and 45 miles east-south-east of Leghorn, and on the high road from Florence to Rome. Siena is an archbishop's see; it has a university frequented by about 300 students, a town library of 50,000 volumes, a college or gymnasium kept by the brothers Scolarum Piarum, a clerical seminary, an elementary school for boys in each parish, and several establishments for female education. It has also an academy of the fine arts, and school of equitation, a deaf and dumb institution, a large hospital, an orphan asylum, a workhouse for the destitute, a savings' bank, and an asylum for poor children. The population of Siena is about 19,000, of whom about 240 belong to the clergy, and 300 are nuns. The principal manufactures of the town of Siena consist of silks and woollens.

Siena abounds with fine churches. The cathedral, one of the oldest in Italy, is rich in marbles, sculptures, and paintings. The exterior is cased with marble, black and white. The pavement is of white marble, on which numerous figures have been engraved or cut in, representing biblical subjects. In the annexed hall, called the Bibliotheca, are ten frescoes by Pinturicchio, representing the principal events of the life of Pope Pius II. (Æneas Sylvius Piccolomini of Siena). The splendid chapel of the Chigi family, constructed by Pope Alexander VII., is rich in lapis-lazuli and green marble, bronzes and statues. The baptistery, which is a separate church detached from the cathedral, as at Pisa and Florence, is an octagon, and entirely cased with marble inside and out, and adorned with sculptures by the earliest Tuscan artists. In the church of S. Dominic is a good painting on wood, the colours of which are well preserved, representing the Virgin and Child by Guido di Ghezzo of Siena, of the date 1221, long before the birth of Cimabue, who has been generally considered as the restorer of Italian painting. Gilio di Pietro, a painter of Siena, was also anterior to Cimabue. The Abbé Richard, in his 'Travels in Italy,' observes on this subject that there is in the Vatican a portrait of St. Francis, by a painter from Lucca, of the beginning of the thirteenth century. In the academy of the fine arts of Siena there is a painting of St. Peter and St. John by Pierrolino of Siena, who flourished about 1100. Siena abounds with productions of the earlier artists, both of its own school and of the Florentine school. Among the numerous churches, those of S. Martino, S. Agostino, S. Spirito, La Concezione, and others are rich in paintings by good masters. In the street dell' Oca is the house, now converted into an oratory, in which Santa Caterina of Siena, a remarkable character of the middle ages, was born in 1347. She became a nun, but acted a considerable part in the political affairs of her age. She mediated a reconciliation between the pope and the Florentines; she repaired to Avignon, where she induced Gregory XI. to restore the papal see to Rome; and she wrote and spoke warmly in support of the claims of Urban VI. to the papacy against the antipope Clement. She died at Rome in 1380. Her letters have been published.

The Piazza del Campo is concave, in the form of a shell, and surrounded by arcades, and adorned with a fountain: it was once the forum of the republic of Siena. Eleven streets branch out of it. The streets of Siena are generally narrow, crooked, and uneven. The general appearance is that of an old decayed city. In the fourteenth century, before the great plague of 1348, the population of Siena and its suburbs amounted to 180,000 The people of Siena are noted for their sociability and good temper, and for the purity and melody of their speech. The females are considered handsome.

Among the palaces the most remarkable is the Palazzo del Publico, or town-house, a massive structure of the middle ages, which is adorned with frescoes of the thirteenth and fourteenth centuries, commemorating events of the national history. The archives of the old republic, which had been removed to Paris by Napoleon, have been restored. The palaces Petrucci, Piccolomini, Saracini, Bandinelli, and Buonsignori contain some good paintings. The town gate, called Porta Camollia, is remarkable for its architecture. Siena is well supplied with good water by aqueducts from the neighbouring hills, and is adorned with several handsome fountains.

In the town library there are several curious MSS., among others a Greek Evangeliarium of the ninth century from the chapel of the imperial palace of Constantinople, a translation of the 'Æneid' into Italian prose made in the thirteenth century, the letters of Santa Caterina, and several autograph letters of Faustus Socinus, who was a native of Siena. (Valéry, *Voyages en Italie*; Faluschi, *Relazione delle Cose più Notabili di Siena*, 1817; Fratini e Bruni, *Il Duomo di Siena*, 1818.)

Siena is said to have been built by the Senones, a tribe of Gauls which migrated into Italy, but of this there is no evidence. It is not reckoned among the towns of antient Etruria. It is mentioned in later times among the Roman colonies by the name of Sena Julia or Sena. (Plin., iii., c. 5.) During the dark ages which followed the downfall of the Western Empire, little is known of Siena, as the invading armies which marched to Rome and South Italy generally passed along the Adriatic coast, avoiding the mountains of Tuscany. Siena is mentioned however as a bishop's see as early as the sixth century. A council was held at Siena in 1058, wherein Pope Nicholas II. was elected. In the subsequent struggle between Gregory VII. and Henry IV. of Germany, Siena, which like the other towns of Tuscany governed itself as a republic, received and assisted the emperor, whilst Florence shut its gates in his face. From that time Siena belonged, generally speaking, to the imperial party, and Florence to the papal side, two opposite factions which afterwards assumed the names of Guibelines and Guelphs, and the two neighbouring republics were therefore frequently at war. The government of Siena was first in the hands of the nobles; afterwards the people obtained a share in it, but the nobles were not totally excluded as at Florence. In 1258 Farinata degli Uberti and the other Guibelines of Florence, being exiled by the Guelph party, retired to Siena, when, having received reinforcements from Manfred of Sicily and from Pisa, he marched with the militia of Siena to meet the Guelphs at Monte Aperto near the banks of the Arbia, where the Guelphs were completely defeated, with the loss of 10,000 men killed, and as many prisoners. The carroccio of Florence was dragged in triumph to Siena. After the establishment of Charles of Anjou at Naples, and the downfall of the house of Suabia, the Guelphs obtained for a time the preponderance at Siena, and the Guibelines were banished. In the mean time Siena extended its dominion over the lowlands of the Maremma as far as the sea, but it never became a naval power like Pisa. About 1368 the popular party, led by the Salimbeni, who, though a noble family, had espoused the cause of the people, drove away the party of the nobles and appointed a council of 'riformatori' to remodel the government. The exiled nobles, being numerous and warlike, ravaged the surrounding country to the walls of the town. At last, in 1369, through the mediation of the Florentines, many of the nobles were recalled, and peace was restored for a time. Fresh troubles however soon broke out; the popular party split into factions, and the whole ended with the council of reformers being abrogated in 1384, and the reformers and their party being driven away to the number of 4000; the whole of the nobles returned into the town.

In 1399 Siena, still distracted by factions, and alarmed at the overgrown power of Giovan Galeazzo Visconti, duke of Milan, who had obtained possession of Pisa, Genoa, and Perugia, thought to avoid greater evils by paying voluntary allegiance to him as its lord, retaining however its own administration. In the convention which was made on that occasion, we find that the territory of Siena extended along the coast of the Maremma from Massa to Telamone, whilst inland it included Montalcino and part of the valley of the Chiana. But the death of Giovan Galeazzo, in September, 1402, dissolved the agreement, and Siena recovered its independence. Some years after Siena was threatened by king Ladislaus of Naples, who came to Tuscany with an army. His death in 1414 put an end to the danger. The republic of Siena next came into possession of Sovana, Pitigliano, and other places in the valley of the Fiora, as far as the borders of the Papal State, as well as of the strong place of Orbetello. In 1432 the emperor Sigismund came to Siena, when he was received with great honour. Alfonso of Naples and his general Piccinino gave much annoyance to Siena, and a conspiracy being discovered in 1456, for the purpose of introducing the king's troops into the town, many of the conspirators were put to death, and the rest banished. In 1460 Pope Pius II. came to Siena, his native town, and strove, but with little success, to put an end to the civil discord which ever lurked in the bosom of that republic. In 1482 a new tumult broke out; many persons were arrested, some thrown out of the windows of the town-house, others beheaded in various prisons, and the rest banished, fined, and excluded for ever from civil offices. The old party of the reformers was then recalled, and the government became more democratic, but not more orderly; for factions continued to rage among the people—individuals were beheaded, and others exiled, until 1487, when the exiles of the party of the 'Nine,' as they were called, entered the city by stratagem, and took possession of the state. A council of 720 citizens was then appointed from out the various 'monti,' or parties, which appointed a 'balia,' or executive council of 24 individuals, for five years, which was afterwards confirmed in 1491, but on the condition that the public offices should be no longer given by favour, but drawn for by lot. In this business Pandolfo Petrucci, a citizen of an old family of Siena, a clever ambitious man, began to act a considerable part, being the most able, active, and influential member of the balia. Petrucci contrived to make himself still more powerful in the subsequent general disturbances of Italy, through the march of Charles VIII. of France for the conquest of Naples, and the wars that followed, until, being supported by Louis XII. of France, he became in reality the dictator of Siena. Machiavelli has described Petrucci as one of the most able and successful usurpers, who managed to support himself by those very men who had once been his enemies. He was however unscrupulous towards those whom he could not win over, as he showed by ordering the murder, in July, 1500, of his own son-in-law Niccolo Borghesi, who constantly opposed his usurpation. Petrucci died in 1512, and was buried with great splendour. His sons, not having the capacity of their father, did not long retain power, and were obliged to emigrate. Fresh civil tumults broke out, and this at a time when every state of Italy was threatened with destruction from the contending armies of Charles V. and Francis I. After the fall of Florence in 1530, Siena retained for many years its republican government, under the protection of Charles V.; but civil dissensions continuing, the emperor sent thither a Spanish garrison to enforce order, in 1547, and began building a castle to overawe the town.

In 1552 the citizens, weary of Spanish interference, rose in arms and drove the Spaniards away, and applied for assistance to Henry II. of France, who sent them a small garrison. They also made common cause with the Florentine exiles led by Pietro Strozzi, which gave to Duke Cosmo of Florence the wished-for opportunity of interfering in the affairs of Siena. His troops, united to those of the emperor, commanded by the Duke of Marignano, ravaged the country, and destroyed the towns and villages which remained faithful to Siena. It was then that the Maremma was reduced to a wilderness. At last, in April, 1555, Siena capitulated through famine. In 1557 it was given up by Spain to Duke Cosmo, who reunited it with the rest of Tuscany, of which it has ever since formed a part. (Malavolti, *Historia de' Fatti e Guerre dei Sanesi*; Pecci, *Memorie Historico Critiche della Citta di Siena*.) A number of the citizens of Siena, after the surrender of that city, took refuge at Montalcino, where the French garrison under Monluc had also withdrawn itself, and there organized the semblance of a republic. But the peace of 1558 between France and Spain having obliged the French to withdraw from Montalcino, the citizens came to terms with Duke Cosmo, and swore allegiance to him in August, 1559, and thus terminated the last trace of the independence of Siena. (Botta, *Storia d'Italia*, b. x.)

SIENITE. A compound of quartz, felspar, and mica, being called granite, we find in many instances hornblende instead of mica, and the rock is then called sienite or syenite (from Syene in Egypt, where such a rock is well known). If we imagine (what is of common occurrence) the diminution of the quartz, and the partial obscuration of the crystalline structure, the rock becomes greenstone. If in place of hornblende we find hypersthene or epidote, the rock may be called hypersthenic or epidotic sienite, as in the Val di Fassa and Shetland. Definition fails in respect of sienite, as it does in regard to other rocks of igneous origin.

Dr. M'Culloch ('Treatise on Rocks') ranks two rocks usually called sienite (one composed of quartz, felspar, and hornblende, and the other of quartz, felspar, hornblende, and mica) as granite. Mount Sorrel in Leicestershire, the Malvern Hills, and Criffel in Galloway, afford abundant and characteristic sienites.

SIERRA LEONE (properly Leona) is the name of a cape situated on the west coast of Africa, near 8° 30′; but when the English established a colony in the vicinity of this cape, the name was extended to the colony, and to that tract of country which was annexed to it. At present the term is generally used in this sense. Geographers frequently use the term in a still more extensive signification. As the countries of Western Africa south of the Sahara are divided into many small states which are very imperfectly known, in order to promote perspicuity geographers have found it necessary to introduce an arbitrary division, arbitrary as far as regards the political state, but founded on the physical geography of the country. Thus the term 'Coast of Sierra Leone' is applied to those parts of Western Africa which are drained by the rivers that fall into the Atlantic between Cape Verga (10° 12′ N. lat.) and the Island of Sherboro (7° 30′). At Cape Verga, which is moderately elevated, a tract of high ground begins, which extends first north by east, and afterwards east, until it reaches the ranges which surround the table-land of Foota Jallon (near 11° W. long.). This range of high land does not appear to rise more than 1000 feet above the sea, but it is much broken by ravines and narrow valleys, especially on the west, and consequently is very rugged. East of 11° W. long. a continuous range appears to extend west and east until it meets another range running north and south, between 10° and 9° N. lat. and 10° and 9° W. long., which extends to the sources of the Joliba. These two last-mentioned ranges have only been seen from a distance by Europeans. So far the boundary-lines of Sierra Leone are tolerably well known, but we are entirely unacquainted with its southern limits, between the mountains at the source of the Joliba and the coast opposite the island of Sherboro, as our knowledge of this part of Africa extends only about 10 or 12 miles inland, where the country is uniformly low, and generally subject to inundations during the rains. North of Sierra Leone is that part of Senegambia which is subject to the king of Foota Jallon, comprehending the table-land of Foota Jallon, and the countries on the upper course of the Rio Grande and on the Nuñez river. East of Sierra Leone is Sangara, a part of Soodan; but the nations or countries which border on it on the south are unknown even by name. Sierra Leone, according to a rough estimate, covers about 25,000 square miles, being nearly equal to Scotland.

Coast.—From Cape Verga the coast runs south-east to Alligator Point, and is uniformly flat and low, and thickly clothed with mangroves. It is divided into numerous islands by the several arms into which the river Pongas divides, before it reaches the sea. South of Alligator Point is Tumbo Point, a long rocky flat, from which the land rises gradually until it attains a great elevation in Mount Kakulimah, 2910 feet above the sea-level, and Mount Soomba, 1705 feet. From this tract the coast extends nearly due south for about 100 miles to the peninsula of Sierra Leone; and this part of it, which is very low and flat, consists of numerous islands. The coast on the peninsula of Sierra Leone which lies between the æstuary called the Sierra Leone river and Yawry Bay, is rather elevated and generally rocky; and its western beach, from Cape Sierra Leone to Cape Shillen, is beaten by a tremendous surf, which can only be passed by the canoes of the country, and not at all times by them. The eastern shores of Yawry Bay, and those extending thence to the island of Sherboro, are low, flat, and subject to change.

Surface, Soil, and Agricultural Productions.—The peninsula of Sierra Leone, which constitutes the territory of the colony, is surrounded on the north, west, and south by water: on the east it is connected with the mainland of Africa by a low tract, intersected by numerous creeks and rivers, which overflow during the rainy season and form extensive swamps. The peninsula extends from north to south about 18 miles, and from west to east 12 miles: the surface is about 220 square miles, or a little more than the smallest county of England, Rutlandshire. The interior of the peninsula is an elevated region of uneven surface, which rises from 400 to 1000 feet above the sea, and is overtopped by conical peaks, which attain an elevation of between 2000 and 3000 feet. In some places the declivities of this region extend to the shores, but they are usually divided from the sea by a belt of low ground from one to three miles in width: the whole region is covered with a good soil, which, on the arrival of the British colony, was entirely, and is still for the most part, covered with large forest-trees, among which is the silk-cotton tree, the trunks of which are made into canoes, which are often large enough to contain a hundred men. The British have introduced the products of the West Indies, coffee, sugar, indigo, ginger, and cotton, which generally succeed well, especially the coffee. Some European fruits are cultivated on the higher parts, and the vine flourishes in the gardens of Freetown. Yams, mandioc, pumpkins, plantains, and Indian corn constitute the principal food of the inhabitants. Nearly all our garden vegetables are raised in this tract.

If this peninsula, and the mountain-tract of the Kakulimah and Soomba Mountains above mentioned, whose extent is not known, are excepted, the western portion of Sierra Leone is a low plain; but the northern part of it, north of 10° N. lat., has not been explored. This plain, so far as is known, extends about 100 miles inland. Laing observes, that east of the town of Seemera a mountain-range about 60 miles in length extends from south to north, and this chain forms the boundary between the plain and the hilly region. The surface of the plain is level, except in a few places where rocky tracts are traversed by ravines. During the rains many parts of the plain are converted into swamps, which, when dry, are covered with grass nine or ten feet high: in other places there are extensive meadows intersected with thickets, and some portions are overgrown with trees, among which the teak-tree is frequent. Only a small part of this region is under cultivation, though the soil is fertile, consisting mostly of a rich black loam mixed with a little clay and fine sand. In approaching the mountains on the east, the surface of the country is undulating and the rivers run in deep beds: this tract is better cultivated and more populous than the level portion of the plain. The agricultural productions consist of the Carolina or white rice, which attains great perfection; red rice, which the natives prefer for their own consumption, on account of the length of time which it will keep; yams, ground-nuts, mandioc, plantains and bananas, and several roots which grow spontaneously. Cattle are rare, except in the vicinity of the mountains; and horses are not reared. Goats are common, but there are few sheep.

Though the mountains which exist east of Seemera, between 11° and 12° W. long., appear to constitute a range running south and north across the country, they are broken at several places by the rivers which originate farther east, and traverse them in a direction east and west, forming large and wide valleys. Between these valleys there are ridges running in the same direction, and occupying a width from 30 to 40 miles. These ridges do not appear to rise to a great elevation. The highest summit which has been measured is Sa Wollé, near 11° W. long. and 9° N. lat., which attains about 1900 feet: and the town of Semba is built on a mountain 1490 feet high. The base of these hills is clothed with camwood-trees, which supply an article of export. The higher part of the hills up to the summit is overgrown with a grass which remains green all the year round, and is interspersed with single palm-trees. In a few places the hills are bare, owing to their steepness. The valleys are extremely fertile, and watered by numerous rivulets which descend from the adjacent hills. Rice, ground-nuts, yams, plantains, and mandioc are grown to a great extent, especially mandioc, for which this tract is noted. Pine-apples are the most common fruit: clusters of palm-trees are interspersed between the cultivated fields. In this hilly region domestic animals, especially cattle and goats, are numerous.

The most eastern part of Sierra Leone, which extends about 80 or 90 miles east and west, is much more level. In many parts the surface extends in gentle and wide undulations; in others it is broken by deep ravines, and furrowed by numerous rivulets, which are sunk deep below it. The general elevation of this region does not exceed 300 feet above the sea. The face of the country is diversified with hills, extensive vales, and fertile meadows, belted with strips of wood, and decorated with clumps of trees of the densest foliage. The valleys and lower depressions contain a rich vegetable soil mixed with iron-clay and sand. This soil is remarkable for its fertility, and requires little labour; but some of these depressions are converted into swamps during the rains. The larger plantations are those of rice and ground-nuts. Indian corn, yams, and mandioc are also extensively grown. Large flocks of sheep and numerous herds of cattle graze in the pastures. Horses do not succeed, and are imported from Sangara, which lies farther east.

Climate.—There are two seasons, the wet and the dry. The former lasts from May to November, and is always ushered in and terminated by tornados. Nothing can exceed the gloominess of the weather during this period: The hills are wrapped in impenetrable fogs, and the rain falls in such torrents as to prevent any one from leaving his house. At this period the diseases which prove so fatal to the coast have generally made their appearance, though they can scarcely be said to belong peculiarly to any season. The extreme humidity of the climate may be conceived, when it is stated that, in 1828, during the most rainy months (June, July, and August), the quantity of rain amounted to 292 inches; and that in two days (22nd and 23rd of August) there fell 26 inches, which is more than falls at London in a year. The average quantity however does not seem to exceed 160 inches, of which one-half falls in July and August. The air is then loaded with vapours, the destructive effects of which are observed in many objects. Iron is covered with rust; furniture falls to pieces, the glue losing its tenacious qualities; paper, though well sized, becomes unfit for use; woollens, unless frequently dried, become rotten; and shoes and boots are covered with mould in one night. The rapid putrefaction of animal substances and the rapid fermentation of vegetables can hardly be conceived.

Being at no great distance from the equator, a high degree of heat is experienced all the year round. It is even probable that the mean heat of this country exceeds that of the equator, being between 81° and 82°. The greatest heat is experienced in the months preceding the rainy season, in which the mean temperature may be about 83°. The diurnal changes of the thermometer at Freetown rarely exceed 10°; but in the low country the thermometer, in October, November, and December, sometimes varies 15° between sunrise and noon. Sierra Leone does not enjoy the advantages arising from the trade-winds, which in the West Indies operate so powerfully in reducing the temperature and rendering the climate more tolerable to Europeans. There is however a pretty regular succession of sea and land breezes. The sea-breeze usually sets in at ten o'clock, but sometimes two or three hours later, and blows from the west-north-west. It is always cool and pleasant, but varies greatly in strength. The land-breezes set in about nine o'clock in the evening, and are in general heated, and loaded with humid exhalations from the low and swampy grounds over which they pass.

Sierra Leone is noted for the unhealthiness of its climate, but there is great variation in this point in different years. Between 1830 and 1836 the colony enjoyed a succession of healthy years; and it was supposed that the causes which had rendered it so long a terror to Europeans were not likely to recur, but the fatal epidemics of 1837 and 1839 dispelled this delusion. In 1825 and 1826 the mortality was also very great.

These observations refer to the Peninsula, and to the low country along the coast. In the interior the rains are much less abundant, and the heat is much less. According to the observations of Laing, which extend from April to October, it would appear that the heat of the hilly region is at least four or five degrees less, and that even in summer the rains are often interrupted by several fine days in succession.

Rivers.—There are several rivers in Sierra Leone which run from 200 to 300 miles, but the course of nearly all of them is very imperfectly known. The most northern is the Pongas, which reaches the sea, on both sides of 10° N. lat.

by three or four arms. The most northern of these arms, called the Mud Bar, may be entered easily and safely at high-water by vessels not drawing more than 12 or 14 feet, and they may sail up a few miles to the commercial settlements; but farther inland the course of this river is not known. Several rivers fall into the sea between Cape Tumbo and the æstuary called the River of Sierra Leone; but none of them are visited by vessels, though the Scarcies, also called Kaba and Mungo, runs more than 300 miles. The most important river is the Rokelle, which is navigable at certain seasons for a great part of its course. It rises in the mountains which separate Sierra Leone from Soodan, at an elevation of 1417 feet above the sea-level, and runs first south, and afterwards either west or south-west, until it approaches the sea within 30 miles, when it spreads out in a wide æstuary, called the River of Sierra Leone, which is seven miles wide opposite Freetown, and constitutes the harbour of the colony. At the close of the dry season the Rokelle is navigable for boats only to Rokon, a distance of 50 miles from its æstuary; but in all other seasons, to a much greater distance. The course of the Karamanka river, which falls into Yawry Bay, is generally parallel to that of the Rokelle, and sometimes only ten miles from it.

Productions.—Poultry is abundant, but of a very diminutive kind. The wild animals are the elephant, buffalo, a species of antelope, monkeys, leopards, and wolves. The leopards are so dreaded by the natives, that, in those parts where these animals are numerous, they will not travel unless in company and well armed. The hippopotamus is found in the lower parts of the river, and several kinds of snakes are numerous. The guinea-fowls, which are plentiful, are much larger than those in England. Fish abound in the rivers and along the shores. Wild bees are very numerous, and honey and wax constitute articles of export. Iron is worked in the most hilly part of the country. The natives have much gold, but it is brought from the countries on the upper part of the Joliba. Salt is made along the low shores.

Inhabitants.—Five different tribes inhabit this country, all of whom belong to the negro race, but they have attained different degrees of civilization. The country north of the river Kaba is occupied by the Mandingoes. Between this river and the Rokelle are the Timannees, near the sea, and the Limba farther inland. South of the Rokelle are the Kooranko, and the most eastern portion is occupied by the Soolima. It is probable that there are other tribes in those parts of the country which have not yet been visited by Europeans. The Mandingoes, who are Mohammedans, and have made some progress in civilization, have been noticed before. [**Mandingoes.**] This nation, which is distinguished by its' activity and restlessness, is still penetrating farther south, and some of them hava even settled in the vicinity of the American colony of Liberia. The Timannees occupy a country extending 90 miles from east to west, and 55 from north to south. Their country is divided into four nominal districts governed by headmen, who always assume the title of king. They cultivate the ground, though with less skill and industry than their neighbours. The men do not wear much dress, and the women still less. They dress with less decency than the tribes farther east: the art of making cotton-cloth is far from being general among them. The Timannees are very docile, and they soon accommodate themselves to European habits, and are in general much attached to their employers. They have their fetishes and greegrees, and none of them have embraced Christianity or the Mohammedan faith. The country of the Limba has not been visited by Europeans. The Kooranko occupy a country extending east to the banks of the Joliba. In language and costume they closely resemble the Mandingoes, but they are by no means so handsome, nor so intelligent. The language, excepting a few words which have suffered a little from corruption, is the same as that spoken by the Mandingoes, but their manners bear a stronger affinity to those of the Timannees. They dress however, like the Mandingoes, with great decency, and the manufacture of cotton-cloth is general among them. Kooranko is the first country eastward of Sierra Leone where the manufacture of cloth is common, but it is in general of a coarse quality. Farther east it improves in texture. In Sangara, in Soodan, very fine large cloths are manufactured, which are highly prized, and form an important article of trade among the interior nations. The Soolima, who occupy the country between the Kooranko on the south and Foota Jallon on the north, are described as short and muscular in stature, averaging in height from five feet six inches to five feet eight. They are subject to one sovereign, which circumstance, added to their warlike character, gives them an ascendency in this part of Africa. In their domestic occupations the men and women appear in many respects to have changed sexes. With the exception of sowing and reaping, the cares of husbandry are entirely left to the females, while the men look after the dairy and milk the cows: the women build houses, plaster walls, act as barbers and surgeons; while the men are employed in sewing, and not unfrequently in washing clothes. They dress very decently, and their costume resembles that of the Mandingoes. They have public meetings, or *palavers*, as they are called. Laing observed that persons accused of murder are tried before a jury, which is at great pains to arrive at the true facts of the case, and to give a just verdict. The king has the power of exercising mercy, when solicited by the jury. Mohammedanism has made some progress among them, but even the king, though he has embraced it, does not venture to profess it publicly.

The British Colony of Sierra Leone was established in 1787, by some philanthropists, who intended to show that colonial productions could be obtained without the labour of slaves. In that year 470 negroes, then living in a state of destitution in London, were removed to it, and in 1790 their number was increased by 1196 individuals of the same race, who had been settled in Nova Scotia, but could not bear the severity of that climate. Ten years leter, 550 Maroons were transported from Jamaica to Sierra Leone; and in 1819, when a black regiment in the West Indies was disbanded, 1222 black soldiers and their families were settled there likewise. In 1820 the population amounted to 12,000 individuals. Since the abolition of the slave-trade (1807), the slaves captured by the British cruisers have been settled in the colony, and the population has thus been so much increased, that in 1839, including a few European merchants, it amounted to about 42,000 souls. This population is settled in villages and small towns all over the peninsula. They vary in population from 300 to 2000 inhabitants, and most of them have churches and schools.

Freetown, the capital, stands on the north side of the peninsula, and on the south bank of the Sierra Leone river, about five miles from the sea, in 8° 29′ 30″ N. lat. and 13° 9′ 27″ W. long., on an inclined plain at the foot of some hills, on which are the fort, the barracks, and some other public buildings. It is fifty feet above the sea-level at high-water mark, and regularly laid out into fine wide streets, intersected at right angles by others parallel to the river. Many of the houses are commodious and substantial stone buildings. The population exceeds 6000, among which are about 120 Europeans. Though the river is seven miles wide, the navigable entrance is narrow, there being an extensive shoal with steep sides in the middle of the river, called the Bulam shoals. The river can only be entered with a sea-breeze, which, though tolerably regular, is not always certain either in strength or duration. Regent's town, in a depression between the mountains, contains above 1500 inhabitants.

To the colony ara annexed the islands called Ilhos dos Idolos, commonly called the Isles de Loss, which were purchased in 1818. They consist of three principal islands, Factory, Crawfurd, and Tamara, and several small islets and reefs, inclosing a convenient and safe anchorage for shipping. They are of volcanic origin, being formed chiefly of hard blue- and iron-coloured lava. Crawfurd's Island, on which a settlement has been formed, is about 250 feet above the sea-level, but has no water. These islands are about sixty miles north-west of Sierra Leone, in 9° 0′ 22″ N. lat. and 13° 32′ W. long. The government has lately purchased the Banana Islands, which lie opposite Cape Shillen, the south-western extremity of the peninsula. They resemble the Isles de Loss, but the land is more elevated. They are very fertile, and have plenty of water, but no running streams. Wild cattle are abundant upon the Great Banana.

We have obtained some information about several small towns in the interior. The largest town in the country of the Mandingoes is Fouricaria; in the country of the Timannees are Kambia, Porto Logo, Macabele, and Ma Yosso; in the country of the Kooranko are the towns of Seemera, Kolakonka, and Kamato. The capital of the Soolima is Falaba, which consists of about 4000 huts, and contains 10,000 inhabitants. The towns of Sangoora, Semba, Mousaiah, and Konkodoogore have altogether about 15,000 inhabitants.

Commerce.—The commerce of this colony is not active or important. The principal articles of import are arms, ammunition, flints, tobacco, beads, and handkerchiefs, which are paid for by gold, rice, skins, bees'-wax, cola-nuts, and ivory.

(Laing's *Travels in the Timannee, Kooranko, and Soolima Countries in Western Africa*; Winterbottom's *Account of the Native Africans in the Neighbourhood of Sierra Leone*; Gray's and Dochard's *Travels in Western Africa*; Owen's *Narrative of Voyages to explore the Shores of Africa, Arabia, and Madagascar*; Captain Belcher's *Observations on Various Points on the West Coast of Africa*, in 'Lond. Geograph. Journal,' vol. ii.; *West African Sketches*; and *Parliamentary Reports*.)

SIERRA MADRE. [Mexican States.]

SIERRA MORE'NA. [Spain.]

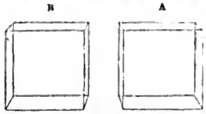
SIERRA NEVA'DA. [Spain.]

SIGÆUM. [Troad.]

SIGARE'TUS. [Chismobranchiata, vol. vii., p. 93.]

SIGHT (vision, the faculty of seeing). The structure and uses of the several component parts which enter into the formation of the organ of vision have been already described in the article Eye. We have now to inquire by what means the images of objects which are depicted on the retina become converted into ideas of the objects themselves; of their proximity and distance; of their solidity and size. In other words, is the interpretation of the sensations of the retina a vital property of the structure itself, or is it in part derived from other sources? The following case, which is recorded by Cheselden, affords us important data on this head. A young man, who was born blind, was suddenly restored to sight by the operation of couching. 'When he first saw,' observes Cheselden, 'he was so far from making any judgment about distances, that he thought all objects whatever touched his eye (as he expressed it), as what he felt touched his skin. He knew not one thing from another, however different in shape and magnitude; but upon being told what things were whose form he before knew from feeling, he would carefully observe, that he might know them again. Two months after being couched, his attention seems to have been drawn to the effects of painting, which he then first and at once comprehended; but even then he was no less surprised, expecting the pictures would feel like the things they represented, and was amazed when he found those parts which by their light and shadow appeared round and uneven, felt only flat like the rest, and asked which was the lying sense, feeling or seeing? Being shown a small miniature of his father, and told what it was, he acknowledged a likeness, but was vastly surprised, asking how it could be that a large face could be expressed in so little room, saying it should have seemed as impossible to him as to put a bushel into a pint. At first he could bear but very little light, and the things he saw he thought extremely large, but upon seeing things larger, those first seen he conceived less, never being able to imagine any lines beyond the bounds he saw. The room he was in, he said he knew to be but part of the house, yet he could not conceive that the whole house could look bigger.' From the details of this interesting case, it would appear that the sense of sight (so far as we can judge of it when performed with one eye, for only one had been operated on when the above phenomena were observed) originally gives us no information respecting the solidity, the distance, or the real magnitude of objects; but that they all seem as if painted on one surface. If this then is the sum of the information which is conveyed to us by the retina; if it is limited to the mere perceptions of the images of objects, and conveys to us ideas relative to superficial extent only, it is clear that our estimation of the true position, the magnitude, and solid forms of bodies must be due to some other sense than that of sight, or rather, to a comparison of some other sense with it; in short, to an act of our comparing and reasoning faculties.

We have seen by the details of the above-quoted case, that there is no essential resemblance between the ideas which are derived from vision and those communicated by touch; and it is no doubt partly owing to this circumstance that we obtain a correct knowledge of external objects through our visual organs. The lad couched by Cheselden could not recognise by sight the things whose form he before knew from feeling; but upon being told what they were, he would carefully observe, that he might know them again. The infant, in like manner, stretches out its little hands to grasp and examine each object in succession which attracts its sight, and the greater part of its waking hours is employed in thus comparing the sensations obtained through these two different channels. That we do acquire important information respecting the size and forms of bodies through the sense of touch there can be no doubt; that the knowledge obtained through our visual organs would be imperfect without it, and that it may in some measure be a corrective of those optical illusions which are so frequent when we attempt to judge of things by sight alone, is equally probable; but in admitting this, we must not underrate the original powers of the eye and the quantity of knowledge which we primarily derive from it. From some facts we are about to notice, it would appear that much of the information which we derive from our visual organs only, has hitherto been attributed to extraneous sources. Physiologists have been too much swayed by the opinion of Gassendus, Haller, Gall, and others, that we see with only one eye at a time, and those oven who disputed this have been more anxious to explain why objects are seen single with both eyes than to inquire into the uses of our possessing two. These defects, which are more or less common to all writers on optics, have been lately remedied by some very interesting observations of Professor Wheatstone on Binocular Vision. He has shown that the simultaneous affection of the two retinæ, provided the optic axes are not parallel, excites a different idea in the mind from that consequent on either of the single impressions; the latter giving rise to a representation on a plane surface, the former to that of an object in relief. This is owing to a different perspective projection of the object being seen by each eye; thus, if any figure of three dimensions, an outline cube for example, is held at the distance of about seven inches before the eyes, and viewed with each eye successively while the head is kept perfectly steady, A will be the picture presented to the right eye, and B that seen by the left. Now if these two pictures are made to fall on corresponding parts of the retinæ, by placing them one in the direction of each optic axis at equal distances before or behind their intersection, the mind will perceive not merely a single representation of the object, but a body projecting in relief the exact counterpart of that from which the drawings were made.

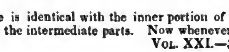


But a better method is to employ the stereoscope, an instrument invented for the purpose by Mr. Wheatstone, the essential parts of which are two plain mirrors inclined with their backs towards each other at an angle of 90°. The two pictures A and B are placed in the same horizontal line, and parallel to each other at the sides of these mirrors, and at equal distances from them. The observer then placing his eyes as near as possible to the two mirrors, their angle coinciding with the middle line of his forehead and face, sees the solid body represented by the perspective drawings standing forward in relief, provided the two drawings are so situated that their images reflected by the mirrors coincide with the lines of the convergent optic axes. When similar images, differing to a certain extent in magnitude, are presented, by means of the stereoscope, to corresponding parts of the two retinæ, a single object, intermediate in size between the two monocular pictures, is seen. Were it not for this, objects would be seen single only when the optic axes converge directly forwards; that is to say, when the object is equally distant from the two eyes; for it is only then that the images on the retinæ can be of equal size, the size of the image being dependent on the angle under which the object is seen, and this being less as the object is more distant. As our conviction then of the solidity and projection in relief of bodies depends upon a different perspective image of them being presented to each retina, and as this can only take place when the axes of the eyes are made to converge to them, it follows that when objects are at such a distance that in regarding them the optic axes are parallel, their images on the retinæ will be exactly similar, and the idea conveyed to the mind will be the same as if they were seen with one eye only. Hence, when two perfectly similar pictures of an object are viewed in the stereoscope, although they coalesce, they appear but as painted on a flat surface. With a knowledge of these facts, it becomes easy to explain why the artist is unable to give a faithful representation of any near solid object, that is, to produce a painting which shall not be distinguished in the mind from the object itself. When the painting and the object are seen with both eyes, in the case of the painting two similar pictures are projected on the retinæ; in the case of the solid object the pictures are dissimilar: there is therefore an essential difference between the impressions on the organ of sensation in the two cases, and consequently between the perceptions formed in the mind; the painting therefore cannot be confounded with the solid object. As our belief then in the solidity of a near object is owing to our taking cognizance of the impressions on both retinæ, it is interesting to inquire whether any other kind of information is imparted to us by the possession of two eyes, which we should not obtain by one only. It is well known that if we close one eye, and attempt to judge of distances with the eye that remains open, our conjectures are wide of the mark, and the rationale of this has been explained by Le Cat, in his 'Traité des Sensations,' in the following words:—'The concurrence of the optic axes, and the length of the angle they form, are the fundamental principles for estimating the distance of objects: hence it is that when we look with one eye only, we are unable to distinguish distances, and cannot place the end of the finger directly upon an object indicated to us, though it be very near, for the finger hides the object, and appears to correspond to it as exactly when it is at the distance of a foot, as if it were only a line removed from it. But if our other eye be open, it will see the finger and the object from the side, and will therefore discover a considerable interval between them if they are a foot distant from each other, but only a very small interval if they are very near; and thus we are enabled to place our finger with certainty upon the desired object.'

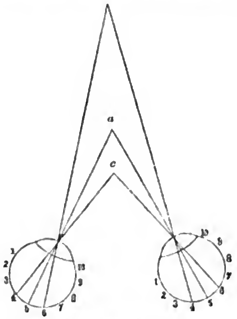
The convergence of the optic axes which takes place when we regard objects within a short distance of us, is supposed by many to assist us in our judgment of the magnitude of bodies, and if this is admitted, it is another proof of the variety and extent of information conveyed to the mind by the possession of two eyes, which a monocular organ could only have afforded with the aid of the movements of the head and of the sense of touch. The confusion of vision and the indetermination of judgment which follow the loss of an eye, often continue for many months, and strikingly illustrate the truth of the foregoing remarks. Our estimation of the distance and size of remote objects is purely a matter of experience: an object appears distant in proportion to its indistinctness of colour and outline, to the number of intermediate bodies seen between it and the observer, and to its appearing relatively smaller than these. We judge of the magnitude of objects by a calculation founded on their apparent size and probable distance: hence we are liable to continual mistakes on these points. An Englishman in the clear atmosphere of Italy supposes distant objects to be nearer to him than they are. A mountain which we see at a distance for the first time appears generally much less than it really is, and we think it near us when it very far away. From these remarks it is evident that the mind is constantly co-operating in the acts of vision, so that it becomes difficult to say what belongs to mere sensation, and what to the influence of the mind: that the latter must take an active part in the conceptions of vision, is evident from the great difference in the extent of the actual and the mental field of vision. The one is dependent on the extent of the retina; the other has no determinate limits: in one, all objects are of equal magnitude that are seen under the same angle, and therefore produce an image of the same size upon the retina; in the other, the images of these objects, though viewed under the same angle, are of various sizes and placed at very different distances.

It is scarcely necessary to say much in reference to the movement of bodies: we judge of their motion partly from the movement of their images over the surface of the retina, and partly from the movement of our eyes following them. If the image upon the retina moves while our eyes and body are at rest, we conclude that the object is changing its relative position with regard to ourselves. In such a case the movement of the object may be apparent only, as when we are fixed upon a body which is in motion, such as a ship. On the other hand, the image may remain fixed on the same spot of the retina, while our eyes follow the moving body; we then judge of its motion by the sensations in the muscles which move the eyes. If the image moves only in correspondence with the actions of the muscles, as in reading, we infer that the object is stationary. The sensations of rotatory movements of objects, produced by turning the body on its axis, are quite independent of any impressions on the retina, and their consideration is therefore foreign to the subject we are treating of. The apparent movement of objects after looking at those really moving, arises from the successive disappearance of spectra left by the moving bodies. From the fact that artificial excitement of the retina, either by pressure, electricity, or any other cause, gives rise to the perception of colour as well as light, we infer that the retina is the seat of these sensations. The colour of luminous bodies depends upon the quality of the light they emit; the colour of bodies that are not luminous is due to the light which falls upon them, and is reflected by them towards our eyes. When a body absorbs all the rays of light which fall upon it, its colour is black; when it reflects them all, it is white; and when it absorbs some and reflects others, it is coloured. In ignorance of the cause of some bodies reflecting certain rays, and others different ones, we express the fact by saying such a body has an affinity for such coloured rays. The question has often been raised, why is it that we see objects erect, while their images on the retina are inverted? According to most physiologists, it is by virtue of a certain property of the retina by which each point of an object is seen in the direction of a line perpendicular to its surface: now since this surface is concave, the rays proceeding from an object which fall on the lower part of its concavity will incline upwards, while those which impinge on its upper part will incline downwards; and thus the object presented to the mind will be the reverse of that which is depicted on the retina. Many physiologists reject this theory, on the ground that it involves an impossibility, since each point of the image is not formed by rays having one determinate direction, but by an entire cone of rays; they affirm moreover that vision can consist only in the perception of the state of the retina itself, and not of anything lying in front of it in the external world. They argue further, that no explanation of erect vision is required, as long as all things equally, and not some objects only, appeared to the eye inverted; for nothing can be inverted where nothing is erect, each idea existing only in ontithesis to the other. A question not less agitated than the one we have just discussed, is that of single vision with both eyes. We shall not inquire into the merits of the various theories that have been invented in order to account for this phenomenon; but shall merely advert to the principal conditions which are essential to single vision, in order that we may explain under what circumstances double vision results.

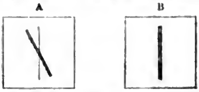
If two fingers are held up before the eyes, one in front of the other, and vision is directed to the more distant, the nearer will appear double, while if the nearer one is regarded more particularly, so as to appear single, the more distant will be seen double, and one of the double images in each case will be found to belong to one eye, and the other to the other eye. This phenomenon has given rise to the hypothesis that there are certain corresponding or identical points on the two retinæ, and that when these are effected simultaneously, single vision results; while if the image of an object falls on parts which are not identical, it is seen double. A knowledge of these facts is obtained in the following manner:—If in a dark room with our eyes closed we make pressure with the finger upon any part of the ball of the eye, so as to affect the retina, a luminous circle will be seen in the field of vision at the opposite side to that on which the pressure is made. If we press on both eyes simultaneously, *one* luminous ring is seen when 'identical' parts are pressed on, and *two* rings when 'non-identical' parts receive the pressure. By this means it has been ascertained that the upper and lower portions of the two retinæ are identical with each other, and that the outer lateral portion of one eye is identical with the inner portion of the other, and so of the intermediate parts. Now whenever the axes

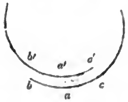


of our eyes converge to an object, its image falls on corresponding portions of the two retinæ, and it is seen single; when we regard it without making our optic axes meet in it, as in the experiment of holding up two fingers, non-identical parts of the retinæ are affected, and it is seen double. To illustrate this, let *a* be a point towards which the axes of the eyes are directed, and *b* an object more distant from the eyes. An image of *a* will fall upon identical points of the two retinæ, namely, upon the central points 5, 5; *a* will consequently be seen single. The image of *b* will fall in the left eye at 6, and in the right eye at 4. The points 4 and 6 of the two eyes being non-identical (since the identical parts are marked with corresponding figures), *b* will be seen double; and the distance between the two images of *b*, in proportion to the extent of the whole field of vision, will be the same as that between 4 and 6, in comparison with the distance between 1 and 10 in each retina. The centre of the retina furnishes the most distinct vision, therefore double images, which generally fall on the lateral parts, are indistinct.



The position of double images depends upon the point at which the axes of the eyes decussate; if in front of the object, the left hand image belongs to the left eye, and the right hand image to the right eye; while if the axes converge to a point beyond it, the converse of this is observed. That objects will not in general be seen single, unless their images fall on corresponding portions of the two retinæ, is further confirmed by the phenomena which are observed in strabismus, and by the experiment of displacing the axis of one eye by pressing on it with the finger; but that exactly identical points of the retinæ must be effected by similar points of the two images, is sufficiently refuted by Mr. Wheatstone's discovery of different perspective projections being presented to each eye. Mr. Wheatstone has also shown that under some circumstances similar pictures falling on corresponding points of the retinæ may appear double and in different places. If to one eye we present in the stereoscope a vertical line B, to the other eye a line inclined some degrees from the perpendicular, we shall see a line the extremities of which appear at different distances before the eyes. If now we draw a faint vertical line, intersecting the inclined line at its centre, as at A, and present the two drawings to the eyes as before; the two strong lines will still coincide, and the resultant perspective line will occupy the same place, while the faint line, though it occupies the same part of the retina as the vertical line B, appears in a different place, namely, at the intersection of the planes of visual direction of the two eyes. In quadrupeds the relation between the identical and non-identical parts of the retinæ cannot be the same as in man, for the axes of their eyes generally diverge and cannot be made to meet in one point of an object. Müller therefore supposes that there are parts of their retina which are identical, and parts which are not identical, which have no corresponding parts in the other eye, and the relation of the two retinæ to each other in the field of vision may be represented as below.





Although the theory of corresponding points is the most perfect that has yet been offered in explanation of the phenomena of single and double vision, yet the facts which have been advanced against it by Mr. Wheatstone are sufficient to show that it cannot be adopted without some limitation. Were it even not liable to these objections, it would still only express the *conditions* required for single and double vision, and would leave unexplained the *cause* of two impressions giving rise to one sensation.

There are several curious phenomena connected with the subject we are treating of, some of which we will briefly allude to. If a piece of white paper is viewed through two different coloured glasses, held one to each eye (for instance, though a blue and a yellow glass), the paper is not seen of a green colour, but in part blue and in part yellow. Sometimes one colour predominates, sometimes the other; and if the experiment is long continued, the mingling of the colours, to which there was at first no tendency, becomes more evident. Similar phenomena are observed when two dissimilar pictures are viewed in the stereoscope, and it does not appear to be in the power of the will to determine the appearance of either picture or either colour. These facts seem to show that the two eyes are not always in action together; but that at one time the sensations of one eye predominate, and at another those of the other. If the eyes are closed after being fixed for some time on an object, we still continue to see its image, and the duration of this image, or 'spectrum,' as it is called, is in a direct ratio with the impression which caused it.

Spectra left by the images of white or luminous objects are ordinarily white or luminous, and those left by dark objects dark; but if, instead of closing the eyes, they are directed upon some white surface, as a sheet of paper, the colours of the spectra are reversed, those which were white when the eyes were closed becoming black when directed to the white surface, and *vice versâ*. These phenomena are easily explained. The part of the retina which has received the luminous image remains for some time afterwards in an excited state, while that which has received a dark image is in an unexcited and therefore much more excitable condition. When the eye in this condition is directed towards a white surface, the luminous rays from this surface produce upon the excited parts of the retina a much more feeble impression than upon the unexcited, and the latter consequently appear more illuminated. Spectra are sometimes coloured, although the objects which excited them are colourless; such is the case if the impressions on the retina are very intense, as when produced by the sun's image. But the most curious phenomena relative to ocular spectra arise from the impression of coloured objects on the retina: the spectra consequent on these, although coloured, are not of the same colour as the object, but the opposite or complimentary colour. Thus the spectrum of a red object is green, that of a green object red, that of a violet yellow, &c. There are two modes of explaining these phenomena, the least objectionable of which is the following, offered by Müller: 'The perception of any one of the three simple colours consists merely in the retina being in one of those conditions to which it has a tendency when in a state of excitement; if this condition be artificially excited in an intense degree, the retina acquires an extreme tendency to that of the complementary colour, which consequently is perceived as the ocular spectrum.'

The disappearance of images which fall on the retina at the entrance of the optic nerve, the luminous circles seen on making pressure with the finger on the globe of the eye, and the vascular network which under certain circumstances we perceive in our own retina, have already been alluded to and their causes explained in the article EYE.

Defects of Sight.—Under this head will be comprehended short-sight, long-sight, double vision, and the defective perception of colours.

Myopia, or Near-sightedness (from μύω, 'I shut,' and ὤψ, 'the eye,' a short-sighted person being in the habit of winking, or half shutting his eyelids when he endeavours to see objects distinctly).

When the images of surrounding objects are brought to a focus in the eye before they reach the retina, such an eye is myopic; when, on the contrary, their foci would fall behind the retina, it is presbyopic. Individuals thus affected see all objects indistinctly that are viewed at the ordinary distance of distinct vision; therefore, to remedy this defect, they bring them within such a distance of the eye as will ensure their images being brought to an exact focus upon the retina. The point of distinct vision (that is, the distance from the eye at which objects are perceived most clearly) of a perfect eye averages from 15 to 20 inches: an eye which cannot discern objects distinctly beyond 10 inches may be considered myopic; but persons affected with a high degree of myopia have their point of distinct vision as near as two or three inches, or even one inch, to the eye. To short-sighted persons all objects appear magnified; they prefer to read a small type, and see better through a pin-hole in a card than with the naked eye: on the same principle, when they endeavour to see any distant object distinctly, they almost close their eyelids. The explanation of these phenomena is to be sought for in the condition of the eyes themselves: they are generally firmer than usual, their corneæ are preternaturally convex, and their pupils large; hence by diminishing the aperture through which the light is admitted, all but the more direct rays are excluded, and the images on the retina will be more defined. Myopia is seldom observed before puberty, and is much less common in the lower ranks of life than in the higher, but it occurs most frequently in those who occupy themselves much in the examination of minute objects. It is sometimes met with as a temporary affection, subsequent to a long-continued exertion of the eyes in viewing small objects, as after the use of the microscope. These facts point to the propriety of desisting from such occupations as soon as any fatigue is experienced. From the well-known fact of persons becoming long-sighted as they get old, it has been supposed that the vision of short-sighted persons must improve as they advance in years; but this is not found to be the case, the myopia rather tending to increase than to diminish.

The cause of myopia is an over-refractive condition of the eye; either the cornea or the crystalline lens is too convex, or the humours of the eye generally are too dense or too abundant.

Treatment.—Although it is said that short-sightedness rarely comes on before puberty, our own observations lead us to believe that it is more frequently a congenital defect than is generally imagined. If however an incipient case were brought under the notice of the practitioner which could be shown to have followed too great an exercise of the eyes upon minute objects, the cure would probably be found in abstaining entirely for a time from such occupations, refraining also from the use of concave glasses, and employing the eyes chiefly upon large and distant objects. But this defect is one that is so little thought of, and is so easily remedied by the use of glasses, that a medical man is seldom called upon to attempt its cure: the only plausible means that have been recommended with this view are, practising the eyes in reading at gradually increasing distances, and a renunciation of such pursuits as require the concentration of vision upon near objects. The manner in which concave glasses improve the vision of near-sighted persons, is by causing a divergence of the rays of light before they enter the eye, thus counteracting the over-refractive condition of that organ. The glasses that are most commonly used are double concaves, of equal concavity on each side; they are numbered 1, 2, 3, 4, &c., beginning with the longest focus or shallowest concavity. Unfortunately there is no uniform standard adopted in the manufacture of these glasses, so that what one optician calls No. 1, another rates as No. 2, and so on; it is therefore advisable that those who wish to fit themselves with spectacles should try a series of them at an optician's shop, and they should be content with the lowest number with which they can see objects clearly across the street: if it diminishes them much, or gives them a dazzling appearance, or if the eyes feel strained after looking through them for a short time, they are too concave. Spectacles are always preferable to a single eye-glass; and when the individual has met with a pair which suit him, they should not be heedlessly changed for any of deeper concavity. It is also advisable not to wear them constantly, but only on occasions when their assistance is absolutely required.

Presbyopia, or Far-sightedness (from πρέσβυς, 'old,' and ὤψ, 'eye;' this being a state of vision to which old age is almost invariably subject).

Long-sightedness, as the name sufficiently indicates, is an affection the reverse of the one just described, and depends upon opposite causes. Either the refractive powers of the eye are too feeble, or its axis is shorter than is natural; the result is an imperfectly formed image on the retina, from the rays of light not converging sufficiently soon to be brought to a focus. Hence the far-sighted person removes the object he is examining farther from him, or he makes use of glasses whose effect is to increase the refraction of the rays of light before they enter his eye. Far-sightedness is sometimes met with in the young; but it is rare that an individual lives to be old without becoming presbyopic: indeed the sinking of the eyeballs, the flattening of the corneæ, and the smallness of the pupils, all which contribute to this effect, are among the series of changes which every part of our body undergoes as we advance in age. The time of life at which presbyopia first shows itself is generally about forty-five; but there are great differences in this respect, some persons requiring the use of convex glasses at thirty as much as others at fifty. Among the earliest symptoms observed, are a difficulty in reading small print, in nibbing a pen, or in examining small objects; the letters of a book appear misty, and run one into another; and if the effort is long continued, the eyes become fatigued and the head aches. Notwithstanding this difficulty of distinguishing near objects, distant ones continue to be seen as clearly as before.

Presbyopia, after it has once appeared, generally goes on increasing, so that an individual thus affected requires to change his glasses from time to time for those of a higher power: instances however are recorded of old persons long accustomed to the use of convex glasses recovering their former sight at the advanced age of 80 or 90 years.

Treatment.—The same principles that we have laid down for the treatment of myopia, and for the use of concave glasses, are applicable, regard being had to the opposite condition of the eye, to the present affection. Convex glasses should not be had recourse to too soon, nor should too high a power be used, but the lowest that answers the purpose is to be chosen. When presbyopia occurs suddenly, and in an individual much below the age at which it ordinarily occurs, there is some mischief to be suspected either in the eye or in the brain, which will require an antiphlogistic treatment and a total suspension of the use of the eyes in regarding near or small objects.

Double Vision.—Visus duplicatus, or diplopia, may arise either from a want of correspondence in the movements or position of the two eyes, the vision of each eye singly being perfect; or there may be double vision with one eye only, while the harmony in the movements of the two is not disturbed. The most common example of the first form of the affection is afforded by cases of squinting; but as this defect will be treated of in a separate article, we merely allude to it in this place. More serious and less common is the loss of harmony in the movements of the eyes which results from paralysis of one or more of the orbital muscles. If one muscle only is affected, the eye will move in harmony with its fellow in every direction but the one towards which its paralysed muscle should draw it, consequently in this direction objects will be seen double; but if several are affected, as is not unfrequently the case, then the movements of the eye will be still more restricted, and there will be single vision only when the axis of the sound eye is parallel with that of the paralysed one. These affections appear sometimes to arise from cold; at other times they are dependent upon disease about the base of the brain, as some tumour pressing on the motor oculi nerve, or there may be an inflammatory condition of the brain and its membranes, or a sanguineous or serous effusion involving the origin of the third pair of nerves. Whichever of these may be the cause, our treatment must be directed to remove it, while the state of the eye will be an index of the success or failure of the remedies we make use of. The reason why double vision occurs when the two eyes are not parallel, has been already pointed out in a former part of this article.

Double vision with a single eye is a more rare affection than the one just described, and depends upon some irregular refraction of the cornea or lens.

M. Prévost, who published an account of his own case in the 'Annales de Chimie et do Physique,' 1832, thought it might arise from a fracture, bruise, or partial flattening of the lens, or separation of its laminæ. Professor Airy and Mr. Babbage are troubled with this defect, the latter gentleman with both eyes, but he is able to remedy it by looking through a small hole in a card, or through a concave lens. Professor Airy finds that his eye refracts the rays to a nearer focus in the vertical than in the horizontal plane, and he has ingeniously contrived to remedy it by the use of a double concave lens, one surface of which is spherical and the other cylindrical. The spherical surface is to correct the general defect of a too convex cornea; the cylindrical is to converge or diverge those rays at right angles to the axis, while the parallelism of those which impinge upon it in the plane of its axis is unaffected. Thus the focus of the spherical surface will remain unaltered in one plane, but in the other it will be changed to that of a lens formed by it and a spherical surface of equal curvature with the cylinder. With the aid of a glass of this description Professor Airy could read the smallest print at a considerable distance equally well with the defective as with the sound eye. He found that vision was most distinct when the glass was pretty close to the eye and the cylindrical surface turned from it. 'With these precautions,' he observes, 'I find that the eye which I once feared would become quite useless, can be used in almost every respect as well as the other.'

Defect of the Sense of Colours.—There are some individuals whose eyes present no apparent defect, and who can distinguish clearly the size and form of objects, yet are unable to perceive a difference between certain colours. These persons differ much in the degree of their defect, as well as in respect of the colours which they confound together. Seebeck has divided them into two classes. Individuals of the first class have a very imperfect power of distinguishing the impressions of colours generally; but the defect is greatest with regard to red and the complimentary colour green; these colours being not distinguishable from grey; blue is imperfectly distinguished, and yellow most perfectly. Individuals belonging to the second class likewise recognise yellow best, and err most with respect to the distinction of red from blue. The cause of this defect certainly does not reside in the eye itself, as has been generally supposed, but has its seat in the brain. Sir J. Herschel examined the eyes of an individual affected with this peculiarity, and satisfied himself that all the prismatic rays had the power of affecting them with the sensation of light, and producing distinct vision; 'so that the defect,' observes Herschel, 'arises from no insensibility of the retina to rays of any particular refrangibility, nor to any colouring matter in the humours of the eye preventing certain rays from reaching the retina (as has been ingeniously supposed), but from a defect in the sensorium, by which it is rendered incapable of appreciating exactly those differences between rays on which their colour depends.' It is scarcely necessary to observe that this defect is irremediable.

SIGILLARIA, the name of an extinct genus of plants. It is known by possessing a conical stem deeply furrowed but not jointed; with oblong discoid or nearly round cicatrices or scars, not arranged in a distinctly spiral manner, with frequently three smaller vascular cicatrices in the centre of the larger scars. This genus includes the Rhytidolepis, Alveolaria, Syringodendron, Catenaria, and the Lepidodendron punctatum and appendiculatum of various authors. The largest specimens of these plants occur in the coal-formation and in beds of the mountain-limestone series.

A variety of opinions have been entertained by geological botanists as to the affinities of these plants. Artis thinks them related to Euphorbiaceæ; Schlothein refers them to Palms, and Von Martius to Cactaceæ. Brongniart at one time thought them a family *sui generis*, but has since referred them, with Count Sternberg, to the family of arborescent ferns. Lindley and Hutton think that 'the weight of evidence seems to incline in favour of both Sigillaria and Stigmaria having been Dicotyledonous plants, and of the highest degree of organization, such as Cactaceæ or Euphorbiaceæ, or even Asclepiadaceæ.' To these families they seem to approach, particularly in their soft texture, in their deeply channelled stems, and especially in their scars being placed in perpendicular rows between the furrows. These writers however add that 'in the total absence of all knowledge of the leaves and flowers of these antient trees, we think it better to place the genus among other species the affinity of which is altogether doubtful.'

Brongniart, in his 'Histoire des Vegetaux Fossiles,' enumerates fifty-nine species of Sigillaria, and Lindley and Hutton, in the 'Fossil Flora,' have figured eight species found in Great Britain. [Coal-Plants.]

The circumstamces under which Sigillariæ occur in the strata associated with coal are remarkable, and probably may be interpreted so as to reveal some of the conditions which were necessary for the production of the vegetable mass of coal. The first thing which strikes us is the hitherto almost universal absence of leaves, top, roots, and interior structure; we generally find large fragments, or perhaps almost the whole of the stems, furrowed, and marked by the bases of leaves, but in other respects deficient, truncate at top, and abruptly ending toward the bottom. If the plant lies in laminated shale above a bed of coal, it is generally compressed flat, having the exterior converted to coal, and the opposite sides nearly or quite in contact, to the exclusion of the central (perhaps cellular) portions. If in gritstone above a bed of coal, we find it more or less transverse to the strata, as if in attitude of growth, its top broken off, its lower part enlarged and tumid, and nearly touching the coal-bed, but apparently rootless; the interior full of sandy laminæ or irregular accumulations of sand, fragments of other plants, lumps of ironstone, &c. The tree was certainly hollow when the sandstone was formed; but whether through decay of the internal cellular substance, or a general wasting and consumption of vascular and cellular structure, as suggested by Mr. Hawkshaw from observations of hollowed dicotyledonous trees in South America, is still doubtful. Whether the leafless and apparently rootless trees, which in other respects are in the attitude and have the aspect of growth, did really grow where they appear, and have lost their roots by absorption and conversion into the coaly mass below, or were deposited by drifting with their roots more or less deficient, is a question of great importance, on which some recent excavations on the line of the Bolton railway, a few miles north of Manchester, have thrown much light. Here, above a thin (6-inch) coal-bed, in shaly strata much inclined, are seen several furrowed stems of trees, also inclined so as to stand at right angles to the stratification, most of them evidently rooted, by dichotomizing root-branches, in the clay over the coal. The extremities of the roots are not seen; perhaps they entered the vegetable mass which is now coal, and were carbonised with the other plants. The stems are furrowed, but less regularly than is usual in Sigillaria, and marked less plainly than is usual with the cicatrices of leaves. The 'bark,' as it is called, is coal, showing vegetable structure: the interior is sedimentary rock. These plants are commonly imagined to be Sigillariæ; at all events some of them are likely to prove so (those in which the roots are least obvious, and the base is tumid); others appear to us to be as much allied to Lepidodendron. We have seen specimens, in different coal-districts, certainly congeneric, and presenting the same intermediate characters between Sigillaria and Lepidodendron. Around the bases Mr. Bowman collected abundance of Lepidostrobi, which are usually referred to Lepidodendron.

Upon the whole it is clear that here trees analogous to Sigillaria and Lepidodendron remain in the place, attitude, and circumstances of growth; their roots entered a sort of vegetable magma, partly the fallen accumulation of leaves and fruits of the forests; over this mass and around these stems water left its sediments horizontally; these horizontal strata have been upheaved, and the once vertical stems made to slope in accordance with the movement. These interesting trees have been carefully preserved *in situ*, by the care of Mr Hawkshaw, and models have also been made of them.

SIGISMUND. [Poland—*History*.]

SIGN (Astronomy), a constellation; but in modern times a constellation of the Zodiac only. For the distinction of the sidereal and astronomical zodiac, see Precession (p. 495).

SIGN (Mathematics). Every symbol is a sign of something or other, the original meaning of the word sign syplying to any mark of distinction or designation. The general consideration of the subject of signs comes under the word SYMBOL; for this term sign is exclusively applied in mathematical analysis to the signs of addition and subtraction (+ and −). A positive quantity, as +3, is said to have the positive sign; a negative quantity, as −3, the negative sign.

The theory of these signs is the peculiar feature of algebra, as distinguished from arithmetic [NEGATIVE AND IMPOSSIBLE QUANTITIES]; and it is difficult to place it on any satisfactory basis except that of distinct definitions not wholly derived from arithmetic. On this point however it is not our present purpose to enter further; the object of this article being the application of the signs, and in particular those details of interpretation which are necessary in the application of ordinary algebra to geometry. By ordinary algebra we mean that system in which the positive and negative quantities are fully capable of interpretation, but in which $\sqrt{-1}$ is considered as incapable of interpretation.

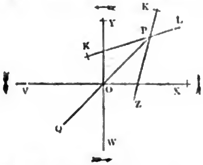
The relative meaning of + and − is direct opposition of properties; and it is only where direct opposition is possible that complete interpretation can exist. The symbol $+a$ means not only a units of its kind, but a units directed to be considered in a specific one of two (the only possible) lights, or used in a specific one of two (the only possible) manners; the first generally implying the second. Thus let a inches be measured from a given point; the superposition of + or − tells nothing, for the measurement may be made in an infinite number of different directions. Choose one of these directions, or rather one line of direction, and the indeterminate character of the proposal (to measure a inches from the given point) is almost gone: there are but two directions in which to do it; if one of them (no matter which) be signified by $+a$, the other (no matter which, except with reference to the first) must be denoted by $-a$.

A problem may present different sets of oppositions of very different kinds. Thus we might have a problem in which there are concerned together—1, time before or time after a certain epoch; 2, height above or height below a certain level; 3, the debtor or creditor side of certain books. To give a more precise idea (it is hardly worth while to frame a specific problem), a man might engage to build a wall on different terms as to the foundation and what is above the ground; for which he might have to borrow money and pay interest up to a certain time, when by receiving the whole amount due to him he might repay and invest besides; and the whole transaction might have to be properly entered in his books. The young student might suppose that if +1 and −1 represent a foot of the wall above and a foot below the ground, it will not necessarily follow that +1 and −1 (undistinguishable from the former) will do to represent one pound of interest due to and from the contractor; and still less that the same +1 and −1 will also do to direct 1*l.* to be carried to the debtor or creditor side of his books. But what he will learn from a properly established algebra (and until he has learnt it, he is not in possession of any part of the difference between algebra and arithmetic) is this—that he would gain absolutely nothing by inventing such distinctive symbols as would remove his doubt of their applicability. Let (+) 1 and (−) 1 represent feet of wall, [+] 1 and [−] 1 pounds sterling of interest, {+} 1 and {−1} 1 pounds sterling carried to one side or the other of the books; while +1 and −1 represent simple addition or subtraction. Let the problem be fairly translated into algebraical language, and an equation formed in which all the distinctive symbols are seen: algebra teaches that the rules to be applied to that equation differ in no respect whatever from those which would have been applicable if all the signs had come from the same source of meaning. Perhaps it would be better if the student were not allowed to come so easily by this result as he usually does, but should be made to learn by his trouble how unnecessary the distinctions really are, as to operations, and allowed in due time to feel the relief afforded by dropping them.

When a problem admits of but one opposition (say it simply refers to time measured future or past from a given epoch), there is no difficulty about the interpretation of any result. If this result be positive, it must be such time as was called positive when the operation was put into shape; and the contrary. But in the application to geometry, an extension of the interpretation of signs enables us to remove some difficulties in the proper expression of angles, which we proceed to describe.

In the rectilinear figures considered by Euclid, the sum of the external angles is always equal to four right angles. In these figures there are no re-entering angles. [SALIENT.] The proposition remains true when there are re-entering angles, provided that the angles which then take the place of what were called *external* angles be counted as negative. In algebraic geometry it is usual to refer all points and lines to two straight lines at right angles to one another. [ABSCISSA; CO-ORDINATES.] The following conventions must now be employed:—

1. Let VX and WY be the axes of co-ordinates, meeting at O, the origin. Let OX and OY be positive directions; OV and OW, negative directions.



2. A line drawn from O to any point P is in itself (for the present) neither positive nor negative; either sign may be given to OP, but the contrary one must be given to OQ.

3. The line OP may, keeping its sign, revolve round O; nor, if negative, is it to be counted positive when it comes into momentary coincidence with OX; nor, if positive, is it to be counted negative when in coincidence with OV. And generally, a straight line revolving round any point does not take the signs of lines which receive signs on account of the fixed directions in which they are drawn.

4. The angle made by two lines A and B is to have a distinction of sign drawn, according as it is called the angle made by A with B, or the angle made by B with A (the angles made by A *from* B, and by B *from* A, would be better). If the angle of A with B (say $A^\wedge B$) be positive, then the angle made by B with A ($B^\wedge A$) is negative, and *vice versâ.*

5. The positive direction of revolution is that in which a line moves from the positive part of the axis of x to the positive part of the axis of y (as marked by the arrows).

6. The sign of any line drawn through P is thus determined. If OP be *positive*, that direction is positive in which the point P must move so as to revolve *positively;* thus, OP being positive, PK is positive and PL negative. But if OP be negative, the reverse is the case; but the rules need only be remembered which suppose OP positive.

7. When an angle amounts to more than four right angles, the four right angles may be thrown away; and generally, four right angles, or any multiple of them, may be added to or subtracted from any angle.

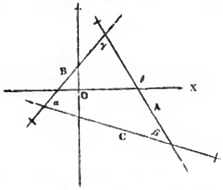
8. In measuring the angles made by two lines passing through P (OP being positive), the positive directions on those lines (found as in 6) must be used: and by $A^\wedge B$, the angular departure of A from B, is understood the amount of positive revolution which will bring B into the position A.

9. Hence it follows that $A^\wedge B$ is either equal to $A^\wedge X - B^\wedge X$, or differs from it by four right angles, X standing for the axis of x.

10. Hence also it follows that in every closed figure, whether such as those admitted by Euclid or not, some of the angles are negative, if every angle $A^\wedge B$ be interpreted as $A^\wedge X - B^\wedge X$. And in every such measurement, the sum of all the angles, with their proper signs, is equal to nothing. But, measured as in (8), the sum of all the angles is nothing, or a multiple of four right angles positive or negative. This ambiguity is wholly indifferent in trigonometrical operations.

To prove the last, let us consider a four-sided figure, of which the sides are A, B, C, D. The angles of the figure, taken in order, are $A^\wedge B$, $B^\wedge C$, $C^\wedge D$, $D^\wedge A$, which, measured as in 9, are $A^\wedge X - B^\wedge X$, $B^\wedge X - C^\wedge X$, $C^\wedge X - D^\wedge X$, $D^\wedge X - A^\wedge X$, the sum of which is obviously nothing. But if any one of these angles should differ from the preceding, it can be only by a multiple of four right angles, whence the sum must be a multiple of four right angles.

We shall now take as an example, the three angles of a triangle, estimating them first by each side with reference to the next, and then by comparing each of the sides with the axis of x. The sides are marked A, B, C; the angles of



Euclid, without reference to sign, are α, β, γ: and the positive and negative directions are marked. Four right angles are denoted as usual by 2π. Required $A{}^\wedge B+B{}^\wedge C+C{}^\wedge A$.

In $A{}^\wedge B$, the amount of positive revolution by which the positive part of B turns round into that of A is $\gamma+\pi$. Similarly for $B{}^\wedge C$, we have $\alpha+\pi$, and for $C{}^\wedge A$, $\beta+\pi$. The sum of these, $\alpha+\beta+\gamma$ being π, is 4π, a multiple of 2π. Now let the angle $A{}^\wedge X$ be θ. Then $B{}^\wedge X$ will be seen to be an angle in this figure greater than two right angles, and will be found to be $\pi+\theta-\gamma$, while $C{}^\wedge X$ is greater than three right angles, and is $2\pi-\alpha+\theta-\gamma$. Hence we have

$$\begin{aligned} A{}^\wedge B &= \theta-(\pi+\theta-\gamma)=\gamma-\pi \\ B{}^\wedge C &= \pi+\theta-\gamma-(2\pi-\alpha+\theta-\gamma)=\alpha-\pi \\ C{}^\wedge A &= (2\pi-\alpha+\theta-\gamma)-\theta \qquad =\beta+\pi. \end{aligned}$$

Only the third angle gives precisely the same in both; in the other two, the second determination gives in each case four right angles less than the first. The sum of the three angles is now O.

The use of this system lies in enabling us to give in a general form propositions which would otherwise require a large examination of particular cases. This examination is not usually made in elementary works; but instead of it, the true result, derived from the superior knowledge of the writer, is made to the reader the consequence of a particular case. In the consideration of curves, for instance, there are to be considered, perhaps at the same time, the co-ordinates, the radius vector, the tangent, the perpendicular on it, and the radius of curvature. The varieties of figure which arise out of these lines are very numerous, and nothing but generalised suppositions, competent to assign definite angles in all cases, can legitimately bring out general propositions. For instances, see TANGENT, SPIRAL; and for further developement, see *Library of Useful Knowledge*, 'Differential Calculus,' pp. 341-345.

SIGN-MANUAL means, in its widest sense, the signature or mark made by a person upon any legal instrument to show his concurrence in it. Before the art of writing was so universally practised as it now is, the sign-manual or signature was usually a cross, attested either by the seal of the party containing his armorial bearings, or by the signature of another person declaring to whom the mark belonged. The latter indeed is still the practice with persons who cannot write. Spelman ('Sigillum') quotes from 'Histoire de Bretaigne,' liv. i., c. 28, a charter of Alan 'le longe,' king of Brittany, dated in 689: 'Under our great seal and sign-manual, and also under the signs-manual comitum Cornubiensis and Leoniensis, in the presence of the archbishop of Dôle, of the chancellor, and of twelve other witnesses ("consenting") whose seals are affixed.'

Sign-manual now however is used to denote the signature of a reigning prince. It is usually in this country the prince's name, or its initial letter, with the initial of his style or title in Latin. Thus the sign-manual of George IV., when prince regent, was George P. R., or G. P. R.; that of the present queen is Victoria R., or V. R.

The royal sign-manual is usually placed at the top left-hand corner of the instrument, together with the privy seal; and it is requisite in all cases where the privy seal and afterwards the great seal are used. The sign-manual must be countersigned by a principal secretary of state, or by the lords of the treasury, when attached to a grant or warrant, it being then the principal act, and it must also be accompanied by the signet or privy seal. But where the sign-manual only directs that another act shall be done, as for letters-patent to be made, it must be countersigned by some person, though not necessarily by these great officers of state. The authenticity of the sign-manual is admitted in courts of law upon production of the instrument to which it is attached. (Comyns's *Digest*.)

SIGNATURE, in Music, is the term by which the clefs and sharps or flats placed at the beginning of each staff are, collectively, known, and by which the key is partly shown. See KEY, where the *Signature* in every key is given.

SIGNATURE, in Printing, is the name given to the letters or figures which are placed at the bottom of certain pages in each sheet of a book, to facilitate the gathering, folding, collating, and binding of it. The French printers generally use figures, but English printers for the most part use small capital letters. The bookbinders' alphabet, as it is called, contains only 23 letters (*j*, *v*, and *w* being omitted); and as the title-sheet, which contains the dedication, preface, &c., is generally printed last, the signatures of the work itself commence with B, leaving A for the title-sheet. If there be other introductory matter besides the title-sheet, small letters, as a, b, &c., are used till the work itself is reached. If the work contains more than 23 sheets, the second set of signatures are AA, BB, or more commonly 2 A, 2 B, &c.; and the third set 3 A, 3 B, and so on. If the work is in folio, it requires only one signature; if in 4to. or 8vo., it requires two, as, for instance, B on the first page and B 2 on the third; if in 12mo., it requires three, as B on the first page, B 2 on the third page, and B 3 on the ninth page; and so on for printed works of other forms.

SIGNET, SEAL. The impression of a seal has been used from the earliest times to prove the authenticity of the documents to which it is attached. Amongst Eastern nations seals were, and still are, rings engraved usually with the name of the owner, and, among the Mohammedans, with some devout aspiration. The delivery of such a seal by the sovereign was a warrant to the holder to exercise the royal functions, or at least served as a credential: of this we find frequent instances in the Scriptures. Sir Edward Coke asserts that seals were used in England a century before the Conquest; and he quotes a charter of King Edwin, dated in 956, and sealed not only with his own seal, but with that of the bishop of Winchester. He also states that the charter of Offa, king of Mercia (755-794), whereby he gave the Peter Pence, 'doth yet remain under seal.' Richard I. was the first king of England who used a seal of arms; theretofore the royal seal had been an effigy of the king armed and on horseback. The seals of the conveying parties are now essential to all legal instruments whereby real estate is conveyed. [DEEDS.]

The law recognises three royal seals:—1. The great seal, which is in the custody of the lord chancellor: this is appended to all letters-patent, and contains two impressions, the one being usually the sovereign on horseback, the other the sovereign seated, supported by emblematical figures, and with the coat of arms somewhere in the field. The great seal is essential to all royal grants of inheritances or chattels real, to grants of an office in fee, and to all writs at common law. Where the king's seal is mentioned, it is understood to be the great seal. 2, The privy seal, which is in the custody of the lord keeper of the privy seal. This seal is valid for the issuing of the royal treasure, or for disposing of chattels, or the contracting or discharging of a debt. It is used as a warrant for letters-patent before they pass the great seal. The privy seal consists of the arms of the sovereign. 3, The signet, or privy signet, which is in the custody of the principal secretaries of state. Excepting that it authenticates the sign manual, this seal seems to have no validity, although it is alleged to be sufficient to give validity to the writ *ne exeat regno*, whereby a subject is prohibited from going out of the realm. For the use of all the seals the countersignature of a principal secretary of state is required by statute. [SECRETARY OF STATE.]

(Comyn's *Digest*, article 'Patent;' *Coke upon Littleton*, Hargrave and Thomas's edition, vol. ii., p. 233.)

END OF VOLUME THE TWENTY-FIRST.

Printed by WILLIAM CLOWES and SONS, Stamford street.

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